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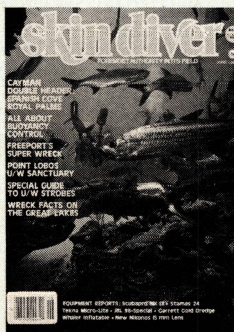
Volume Thirty-two Number Six

FEATURES

- | | | | |
|--------------------------|-----|--|------------------------|
| FOREIGN TRAVEL | 32 | FREEPORT'S SUPER WRECK | STEPHEN FRINK |
| | | Planned with divers in mind | |
| | 87 | AMBERGRIS CAY | DENNIS GRAVER |
| | | Barrier reef off Belize | |
| | 96 | SPANISH COVE | STEPHEN FRINK |
| | | Satisfying today's sophisticated diver | |
| | 104 | DON FOSTER'S DIVE GRAND CAYMAN | DAWN CAHOTY |
| | | Complete vacation complex | |
| MISCELLANEOUS | 35 | TO SAVE A WHALE FOSSIL | |
| | | Salvaging five million years of history | |
| | 68 | ARTIFICIAL REEF IN HAWAII | DOUG WALLIN |
| | | It wasn't easy making the <i>Mahi</i> sink | |
| ADVANCED DIVER TECHNIQUE | 38 | UPS AND DOWNS OF BUOYANCY CONTROL | BONNIE J. CARDONE |
| | | Learning to take charge | |
| LOCAL DIVING | 40 | POINT LOBOS | GLENN POLLOCK |
| | | California ecological reserve | |
| | 44 | SOUTH CAROLINA RIVER DIVING | WENDELL M. PATTON, III |
| | | Diving into history | |
| | 74 | NEW ENGLAND DIVERS TREASURE HUNT | ALLEN SHORT |
| | | A day well spent | |
| | 112 | CORAL CAVES OF PENNEKAMP | DOUGLAS J. COOK |
| | | Archways, rooms and tunnels | |
| DIVE EQUIPMENT | 49 | TEKNA'S MICRO-LITE | BONNIE J. CARDONE |
| | 50 | SCUBAPRO'S MARK IX | GEORGE COZENS |
| | 64 | JBL'S 38-SPECIAL SPEARGUN | FRED FISCHER |
| DIVE BOATS | 52 | BOSTON WHALER'S BWS 13 | ERIC HANAUER |
| | 62 | STAMAS 24 TARPON | STEVE LUCAS |
| U/W PHOTOGRAPHY | 54 | GUIDE TO UNDERWATER STROBES | JIM AND CATHY CHURCH |
| | | What's best for you? | |
| | 60 | NEW 15 MM LENS FOR THE NIKONOS | JIM AND CATHY CHURCH |
| | | Specially designed for the IV-A | |
| TREASURE EQUIPMENT | 58 | GARRETT WEEKENDER GOLD DREDGE | JIM WALKER |
| MARINE LIFE | 82 | FRESHWATER JELLYFISH | BUBBA HAWLEY |
| | | Pleasant surprise | |

DEPARTMENTS

- | | | | | | |
|----|------------------|----|-------------|-----|-------------------|
| 6 | DIVER'S CALENDAR | 19 | SCUBA QUIZ | 77 | Rx FOR DIVERS |
| 8 | WRECK FACTS | 36 | TECHNIFACTS | 80 | FISH OF THE MONTH |
| 10 | FILM FESTIVALS | | | 120 | SHOPPER'S GUIDE |
| | 'N SYMPOSIUMS | | | 124 | DIVER'S DIRECTORY |



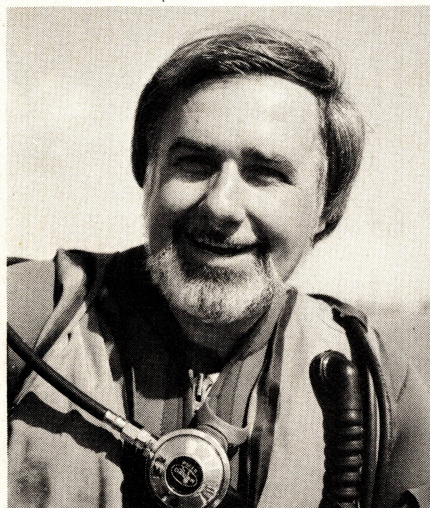
COVER

This majestic school of silver tarpon is one of the unique sights of Grand Cayman. The group of 120 fish is found at Tarpon Alley, 55-70 feet, on the North Wall. Geri Murphy took the photo with a Nikonos III camera and 15 mm lens using double strobes. For more on this site and others in the area see page 96.

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SDM Editorial

BY THE PUBLISHER



SQUARE PEGS, ROUND HOLES

In the January issue SKIN DIVER published an editorial on the current gap which exists with the C-card system of training and certification. Thousands of divers are streaming into Caribbean resorts with C-cards in hand but insufficient ability to dive safely. This avalanche of ill prepared divers is causing a multitude of problems for resort operators, divemasters and even experienced divers.

The variety of problems associated with this phenomenon covers the entire spectrum of trouble. There have been a number of documented cases of dive accidents and close calls which can only be attributed to inexperience and poor preparation. Divemasters are particularly unhappy because they are forced to take risks to save unqualified divers who get into trouble. Experienced divers are equally unhappy because they are forced to put up with the inconvenience of babysitting untrained, inexperienced novices. There has been a backlash among resort operators who no longer trust the validity of the C-card and tend to treat all divers as if they were novices.

How could such a situation develop? In recent issues, SKIN DIVER has covered some of the obvious root causes of the C-card credibility gap. For example, many dive boat skippers and divemasters believe the C-card does not contain sufficient information about the holder's training background or recent dive experience. While log books might be an acceptable alternative, the training associations have failed to make this system of documentation mandatory and therefore it is not universally applied.

There is also evidence that C-card holders often forget scuba skills if they have not been diving for six to 12 months. These dry periods of non-diving diminish self-confidence and tend to leave scuba skills rusty. People who have not been diving for longer periods tend to be even more out of touch with safe diving procedures since equipment design and techniques are ever changing. The lack of sufficient scuba refresher programs on a widespread basis has further widened the gap between the C-card and actual dive skills.

The C-card credibility gap is obviously a complex problem involving many contributing causes—one of which is the "ocean factor." Many C-card carrying divers are turning up in the Caribbean with no preparation or knowledge of ocean diving. They have received their entire training and certification in swimming pools, quarries, ponds, lakes and rivers. These divers haven't a clue about the problems related to bottom surge, surface waves or currents. The first shot of seawater down a snorkel can cause panic and confusion.

We see them on every dive boat: cut and bleeding from coral scrapes; stung by fire coral or hydroids; limping from sea urchin punctures; and sunburned a bright red. No wonder these people are not good divers: They are battered senseless by the ocean environment. The tragedy of this situation is that these poor divers do not know any better. They come to the Caribbean thinking they are fully trained and certified divers, and they have the C-cards to prove it. No one warned them about the ocean and how they should cope with it. When questioning injured divers the answer is always the same, "no one ever told me about *that*...."

Could it be that today's scuba courses are not preparing students for the type of diving they will eventually be doing? It would seem so. According to SKIN DIVER's 1983 Reader Survey, 72 percent of today's certified divers will find their way to the ocean via interstate travel to coastal states. Almost 50 percent of today's divers will make one or more trips outside the U.S. to island dive resorts. Dive travel has had a tremendous impact on this sport. Today's scuba classes need more

content and emphasis on environmental and coral reef touch-me-nots because that is where the students will be going. There is a strong link between ocean environment awareness and safe diving. A bad fire coral sting or sea urchin puncture could lead to panic and embolism.

Whose responsibility is it to prepare the diver for the ocean environment? Resort operators believe it is the job of the instructors issuing the C-cards. Resort divemasters and guides get paid for taking out certified divers and showing them the reefs. That's it. People who arrive in the Caribbean with C-cards are supposed to know how to handle themselves in ocean conditions. They sign up for *dive trips*, not scuba classes.

Fortunately, there are many scuba instructors and dive stores that *do* conduct their open water training in the ocean. The more progressive inland stores and instructors bus their students to the seashore for open water trips to offshore reefs. There are even inland dealers and instructors who package island dive trips with the final phase of their scuba classes. It can be done. It is being done. Unfortunately, the trend is not universal. We still have a gap between inland training and open ocean diving. We are trying to put square pegs into round holes—not bothering to augment the inland student's diving skills and knowledge before salt-water entry.

Is there a way of turning this problem into an opportunity? Very possibly. Could it be that the present C-card credibility gap is being caused by a missing link? Do we need another step in the scuba training ladder? Perhaps we need a course in tropical ocean diving—a course which covers in detail the problems related to wind, waves, currents, resort dive boats, surge, surf and ironshore. Possibly we need a class which describes fire coral, scorpionfish, jellyfish, sea urchins and so on. Maybe there should be a class which really digs into diving safety procedures at dive resorts, repet dive profiles and so on.

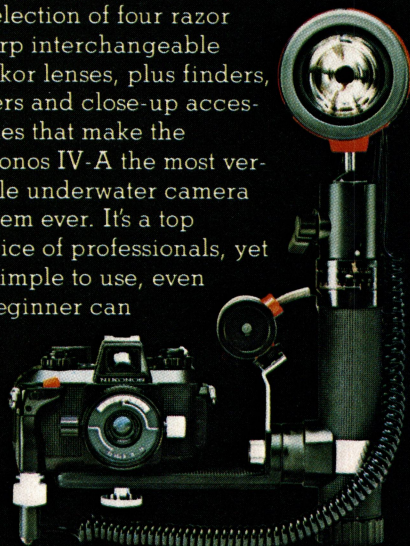
One thing is for certain. New divers must be better prepared for their journeys to island and coastal resorts. Right now the gap between training and actual skills is too wide. 

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Diver's Calendar

June 1-2 The Use of Artificial Reefs as a Fisheries Management Strategy in the Great Lakes—a conference held at the Kellogg Center for continuing Education, Michigan State University. Sponsored by the Michigan Sea Grant College Program and the Institute of Water Research, 334 Natural Resources Bldg., Michigan State Univ., East Lansing, Michigan 48824-1022)

June 4-5 Commercial Diving Experience for Basic Scuba Divers, sponsored by the NAUI Southwest Branch, at the Ocean Corporation. (Contact: Bob Straight, (713) 643-4051 or Ozzie Osborne, (713) 468-0227)

June 19 Aqua-Nut Divers Annual Treasure Hunt & Membership Drive at Horse-shoe Lakes Campground in St. Bernice, IN. Thousands of dollars in prizes. (Contact: Aqua-Nut Divers, c/o Joe Chambers, president, R.R. #1—Box 153-C, Clinton, IN 47842)

June 24-26 Houston Underwater Club International Underwater Photography Contest. In conjunction with the Seaspace colloquium at the Shamrock Hilton Hotel, Houston, Texas. Nine Categories of slides, prints and movies. (Contact: Robert Kershaw, c/o Seaspace, Houston Underwater Club, P.O. Box 3753, Houston, Texas 77253)

July 9-10 Third Annual Monterey Beach Dive Photography Competition. Sponsored by Alameda Divers. (Contact: Steve Rosenberg, c/o Divers Exchange, 649 Pacific Ave., Alameda, CA 94501)

July 10 Third Annual New England Divers Treasure Hunt at Cat Island, Marblehead, MA. Registration deadline July 1. (Contact: New England Divers, 131 Rantoul St., Beverly, MA 01915)

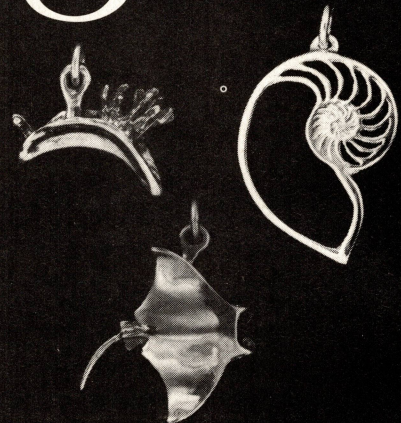
July 24 Second Annual Wisconsin Dive Jamboree. South Shore of Devil's Lake State Park, Baraboo, WI. All clubs and certified divers welcome. Treasure Hunt and prizes. Sponsored by Badger State Divers Club. (Contact: Badgers, P.O. Box 505, Wauwatesha, WI 53187)

August 7 Long Island Divers Association Third Annual Expedition Aqua-Women, aboard the dive boat *Deep Adventure* from Oak Beach Inn, Oak Beach, Long Island, New York. (Contact: Edith Hoffman, 33 Briarwood Road, Wheatley Hts., NY 11798)

August 27-28 26th Annual Colorado Diving Council Skin and Scuba Diving Championships, Grand Lake, CO. Individual and team participation open to all certified divers. (Contact: Kenneth Fox, 1923 Berkeley, Pueblo, CO 81004)

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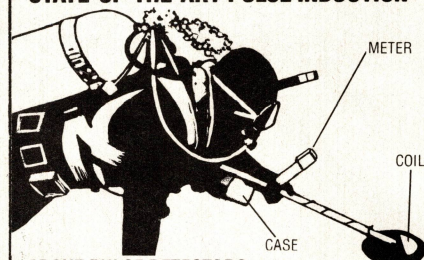


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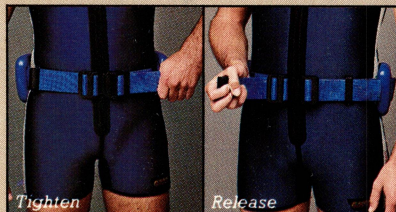
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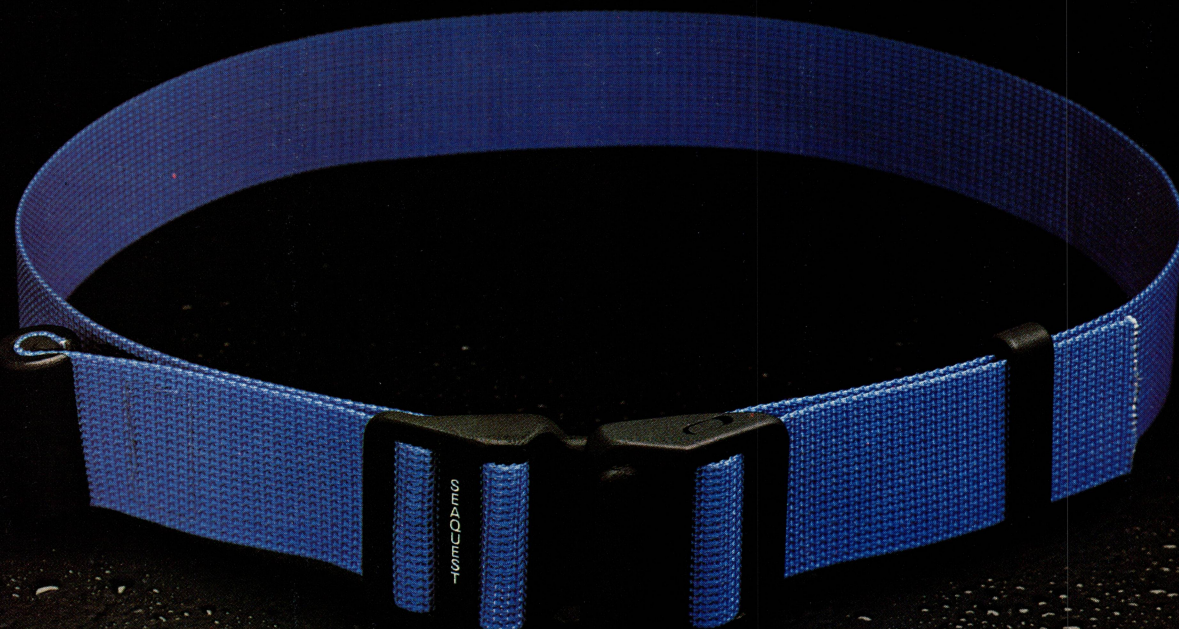
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BY ELLSWORTH BOYD

Many readers are interested in shipwrecks of the Great Lakes. Jim Kanst wants to know about books, organizations, museums—anything related to vessels lost in the Great Lakes.

First of all, Jim, I suggest you contact: The Great Lakes Historical Society, 480 Main Street, Vermilion, Ohio 44089. Next, you might write: Peter Van der Linden, Editor, Publication of the Marine Historical Society of Detroit, 29825 Joy Road, Westland, Michigan 48185. Then try: Phillip Elmes, Chicago Maritime Society, 5508 S. Lake Park Avenue, Chicago, Illinois 60637. Milwaukee is another source. The Milwaukee Public Library owns the famous Herman Runge Collection, consisting of 85,000 ship references and the facts pertaining to them. The collection includes 17,000 illustrations of Great Lakes ships and an index file of 35,000 Great Lakes vessels, including their histories.

As for books, I suggest: *Directory of Shipwrecks of the Great Lakes* by Karl E. Heden; *Love of the Lakes and Shipwrecks of the Lakes* by Dana Thomas Bowen; *The Great Wrecks of the Great Lake* by Frederick Stonehouse; and *A Guide to Sunken Ships in American Waters* by Kaplan and Lonsdale.

A workshop was held in November 1982, on how to research ships and shipwrecks of the Great Lakes. It was directed by Dr. Charles E. Feltner, 166 S. Lafayette, Dearborn, Michigan 48124. Dr.

Feltner is the author of the book: *Great Lakes Maritime History—Bibliography and Sources of Information*.

Captain Gene Luciano of Marco Island, Florida, skipper of the charter boat *Dalis*, asks about a wreck called the *California* that he takes divers to—110 feet deep, southwest of Ft. Myers, Florida. There was an oil tanker of a different name, *Gene*, sunk in the vicinity of the area you are diving. It is called the *City Service Empire*, and was torpedoed February 22, 1942, with 95,000 barrels of crude oil aboard. There is no *California* listed in any of my wreck books. Can you tell me how you got the ship's name? As for the barge you asked about, I can't help you unless you can obtain a name. On your next dive, check the bow, stern and any debris around the wreck and see if you can find anything that might identify her. This could be an interesting project for your divers.

Ron Smith of Mt. Holly, North Carolina, wants info on the *John D. Gill*, the *U-352*, books on Carolina wrecks, and suggestions for freshwater diving in NC.

Ron, for details on the *John D. Gill*, read my article: Cape Hatteras—Wreck Diving Country, SDM December 1981. For the *U-352*: SDM November 1981. I recommend several books that you might find helpful: *Graveyard of the Atlantic* by David Stick; *Wreck—The North Carolina Diver's Handbook* by Jess Harker and Bill Lovin; and the Kaplan and Lonsdale

book I recommended to Jim Kanst. You asked about the "best wreck" to dive off North Carolina. According to Dave Bluett of Vienna, Virginia, who has been on nearly every wreck off the North Carolina coast, the *U-352* is one of the best because of its history.

Your final question, Ron, about freshwater diving in North Carolina, is one I can answer easily. If you haven't tried it, then by all means go for gold in Badin Lake, North Carolina. See my article *Carolina Gold* (SDM March 1982) and write to my friend: Jim Canter, 1501 Arrowwood Road, Asheboro, North Carolina 27203. Jim has a gold dredge and for a nominal fee he will arrange a trip for you and a couple of your dive buddies.

Bob Lyons of Aurora, Colorado, asks if there is a book about shipwrecks in Colorado lakes. As far as I know, there is none, Bob, but this might make an interesting project for an ambitious wreck diver. If readers know of any wrecks in Colorado lakes, let me know and I'll pass the info on to Mr. Lyons.

Readers can help me on another question too. Captain T.S. Jackson of Monte Rio, California, a dive instructor and amateur abalone diver, has asked about the steamship *Savana*, sunk off Fort Ross. I have been unable to locate anything on this ship and would appreciate reader input on it.

Before I sign off, I have two interesting tidbits wreck divers will devour. First, George Meszaros of 350 Alberta Street, New Westminster, British Columbia, Canada V3L 3J5, is an avid wreck diver who has volunteered to help divers research British Columbia shipwrecks. He also suggests that if a reader asks me about a specific wreck that is accessible through a dive charter, that the dive charter's address be listed with the info on the shipwreck. That is a fine idea, George and I shall be happy to comply if the dive charters will send me the particulars.

The second tidbit is a tip on a new book many wreck divers will want to acquire for their library. It's called, *Diver's Directory of Shipwreck Research* by James F. Jenny. Available through Rowe Publications, 3906 N. 69th Street, Milwaukee, Wisconsin 53216, it is sort of a Bible of research for shipwrecks.

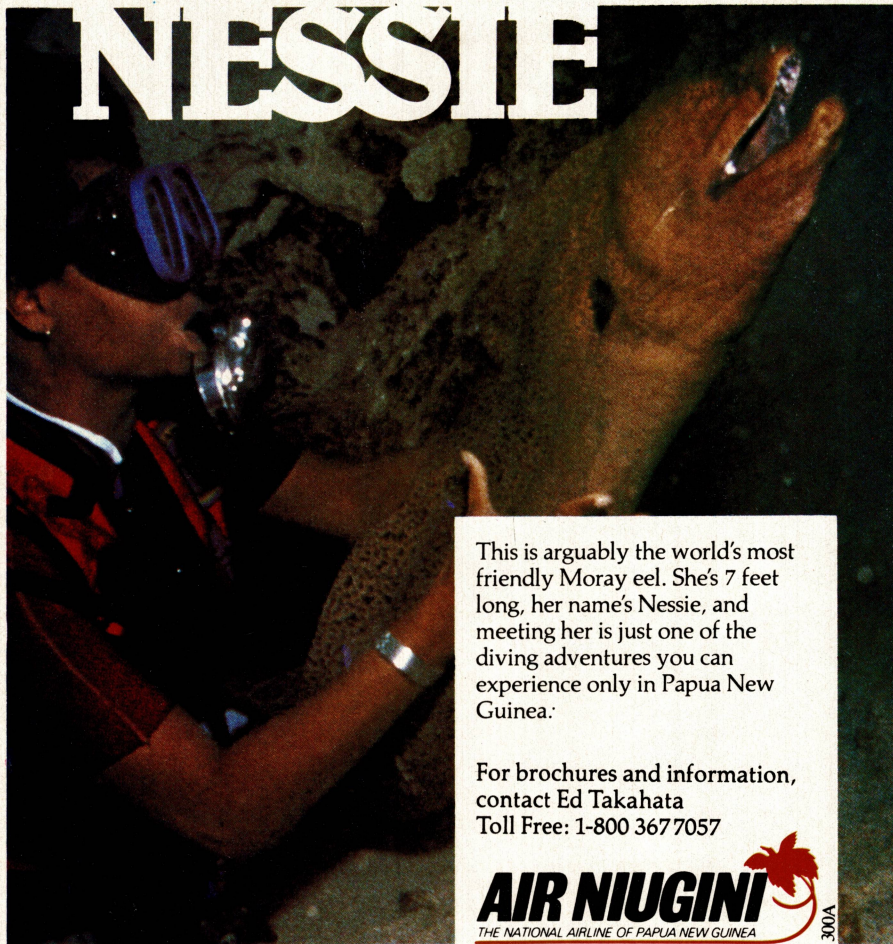
Next time I will have details on an exciting discovery by Darrell Mark Tepoorten, a Los Angeles diver who has discovered a 300 foot, World War II Japanese submarine, sunk in only 60 feet and legally salvageable. Meanwhile, keep those letters coming, and safe diving and happy wreck hunting to you all. Ellsworth Boyd, Rt. 2, Box 408, White Hall, Maryland 21161.

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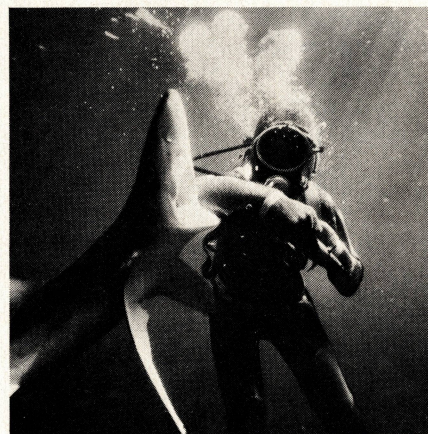
TAYLOR FILM TOUR

Australian underwater filmmakers Ron and Valerie Taylor will make their first tour of Canada July 9-16. They will be presenting their latest films in five cities from the West Coast to the Great Lakes.

The Taylors will present an evening film program in Toronto, Ontario July 9; Edmonton, Alberta July 11; Calgary, Alberta July 12; Vancouver, B.C. July 13 and 14; and Victoria, B.C. July 16.

All ticket holders will have a chance to win an all expenses paid dive holiday for two to Australia via Canadian Pacific Air Lines' Royal Canadian Class, Ansett Airlines and Reef Explorer Cruises.

The line-up of adventure films to be presented includes: *Wreck of the Yonga-*



la and, *Operation Shark Bite*. Diving the Great Barrier Reef, and giant, 150 pound potato cod are subjects of other recent films the Taylors have made and are scheduled to screen during their Canadian tour.

In Ontario and surrounding areas, Ron and Valerie Taylor show information and tickets are available from the Ontario Underwater Council, 1220 Sheppard Ave. East, Willowdale, Ontario M2K 2X1; phone (416) 495-4245. In the other cities, details and tickets are available from local dive shops or contact Cam-Gold Productions, 11551 Pelican Court, Richmond, B.C. Canada V7E 3P3; phone (604) 274-9432 or 738-0397 evenings.

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For more information, contact DEMA at P.O. Box 217, Tustin, California 92681 or call Bob Wohlers (714) 730-0650.

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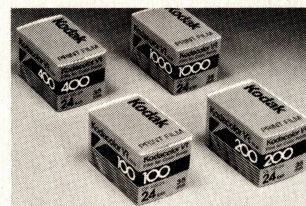
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WATERMAN SETS THE RECORD STRAIGHT

In September 1982, *SKIN DIVER* carried an article on cinematographer Stan Waterman which perpetuated several myths about the man he would like to abolish. These concern the extent of his involvement in several movies and a TV series. While Waterman does produce his own films he was one of three U/W cameramen on the movie *Blue Water, White Death*. (The other two were Ron Taylor and Peter Gimbel.) The producer of this film was Peter Gimbel and it was directed by Gimbel and Jim Lipscomb.

Among other projects erroneously credited to Waterman are some ABC-TV underwater films, the latest of which concerned the Sea of Cortez. Waterman's participation in these was limited to filming and appearing on camera occasionally. As for the movie *Jaws*, Waterman wants it known that he has not had anything to do with this film or any of its sequels.

PADI BETA AND 3/4

The videotape version of PADI's Modular Scuba Course Audio/Visual Program is now available in Beta and 3/4 inch formats, as well as in the original VHS. This gives PADI Training Facilities the option of using the three most popular video formats, or a 35 mm slide/cassette tape.

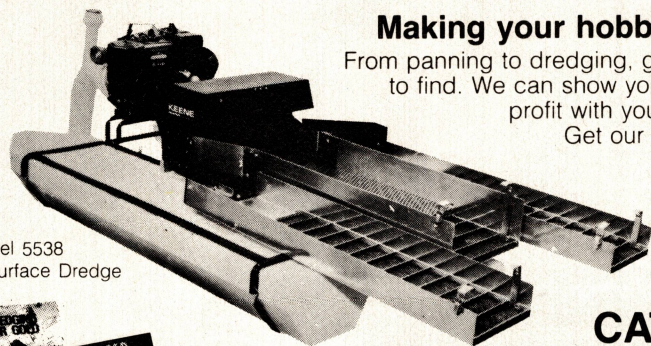
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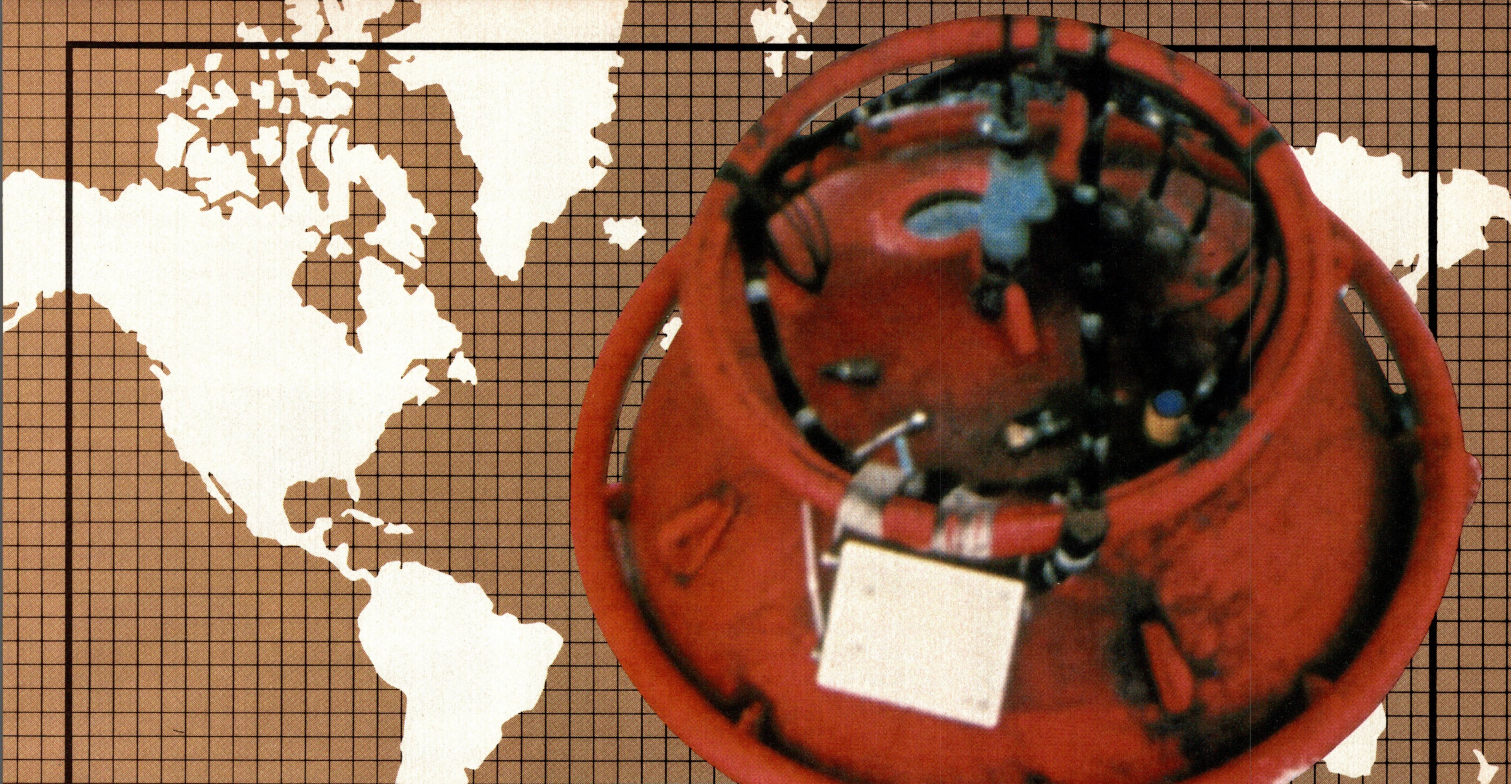
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BARSKY TO DSI

Steve Barsky has joined the staff of Diving Systems International in Santa Barbara, CA. He brings six years of experience in the commercial diving industry to his new position.

At Diving Systems International, Barsky



will be responsible for coordinating government contracts, developing technical manuals, and assisting in the company's marketing effort. In addition to the Super-lite 17 helmet and the Heliox 18 mask, Diving Systems also provides other life support equipment for commercial, military and scientific diving.

JBL SPEARFISHING CONTEST

JBL Enterprises Inc. of Orange, California, has designed a series of educational contests for divers/spearfishermen. The JBL Regional Spearfishing Contests will be held in areas throughout the United States. The dive stores in each area where the contests will be held are offering Spearfishing Specialty Courses to teach speargun safety, techniques, sportsmanship, local rules and conservation; with all of this culminating in the Regional Contest. The winners of each Regional Contest (both free diving and scuba diving) will be invited to attend the National Contest which will be held in Florida this September. Many local celebrities will be attending the various Regional Contests and will help in the distribution of the trophies and awards.

Each buddy team will be limited to the amount and size of fish taken with the greatest aggregate weight of three fish determining the winners. Local fish and game rules will be enforced. All of the fish taken will be donated to local charities.

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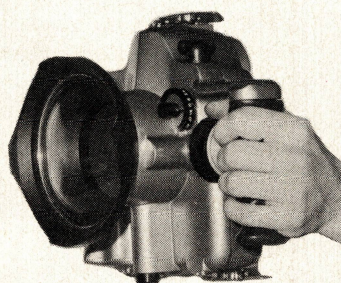
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INDIANA TREASURE HUNT

The Aqua-Nut Divers of Clinton, Indiana will be sponsoring their Third Annual Treasure Hunt and Membership Drive on Sunday, June 19. The event will be held at Horseshoe Lakes Campground in St. Bernice, Indiana with registration running from 11:00 am to 1:00 pm. The dive will begin at 1:00 pm. Divers will be hunting for numbered markers which will determine their order of draw for the hundreds of prizes to be given away.

There is a \$10 entry fee (\$5 for Aqua-Nut Divers members). A special \$20 Membership Drive Special includes: 1) \$10 Treasure Hunt entry fee, 2) membership/I.D. card, 3) club patch, 4) one free air fill from Clinton Scuba Center, 5) free cook-out at many of the monthly dives (including a cook-out at the Treasure Hunt), 6) monthly newsletter, 7) half price admission to many club sponsored events, and 8) door prizes at monthly dives.

Some of the prizes to be offered include: two reale and eight reale reproductions from Designers Edition; a jacket BC, an U/W metal detector, a rechargeable U/W light, plus knives; lights; wetsuit booties and gloves; gear bags; an U/W watch, and much, much more.

For further information contact: Aqua-Nut Divers, c/o Joe Chambers, President, R.R. #1 - Box 153-C, Clinton, IN 47842; (317) 832-9930 or (317) 832-7420.

ORCA COMPUTER CORRECTION

In our Spring Shopper's Guide (April 1983) we featured the E.D.G.E. decompression computer from Orca Industries. The price listed was incorrect. The suggested retail price is actually \$675. For more information contact Orca Industries, Inc., 335 Lancaster Ave., Frazer, PA 19355.

UNDERWATER TECHNOLOGY PROGRAM

A new program leading to certification as a hyperbaric medical technician will be offered by the Underwater Technology Department at Florida Institute of Technology. The program is designed to help meet the growing need for qualified technicians in the field of hyperbaric medicine. Hyperbaric oxygen therapy is used in the treatment of such medical problems as gas gangrene, carbon monoxide poisoning, non-healing wounds, burns and smoke inhalation.

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Scuba Quiz

Category: Buoyancy Control

By Dennis Graver

Control of buoyancy is probably one of the best indicators of diving ability. Modern equipment can simplify the task, but there is far more to maintaining neutral buoyancy than merely pushing buttons. How good are you at controlling buoyancy? Can you keep the following questions from getting you down? The answers are on the following page. NOTE: Select all correct answers. Some questions have more than one correct response.

1. Which of the following factors do *not* affect a diver's buoyancy:

- ☐ A. Temperature of the water at depth
- ☐ B. Amount of air in the tank
- ☐ C. Amount of air in the lungs
- ☐ D. Type of diving (skin or scuba)

2. Buoyancy for scuba diving should be tested at the surface with the lungs:

- ☐ A. Fully deflated
- ☐ B. Inflated with a normal breath
- ☐ C. Deflated for a normal breath
- ☐ D. Fully inflated

3. When a diver is overweighted and neutral buoyancy is achieved by adding air to the BC, which of the following is increased:

- ☐ A. Swimming resistance
- ☐ B. Rate of change of buoyancy with depth
- ☐ C. Equipment comfort at depth
- ☐ D. Ability to control descent

4. An underweighted diver is likely to experience:

- ☐ A. Decompression sickness
- ☐ B. An air expansion injury
- ☐ C. Overexertion
- ☐ D. A squeeze

5. For a deep dive, a diver should adjust the weights for neutral buoyancy at:

- ☐ A. The planned depth
- ☐ B. A depth of 10 feet
- ☐ C. A depth of 40 feet
- ☐ D. The planned depth and at 10 feet

6. Buoyancy adjustments should be made:

- ☐ A. During descent
- ☐ B. Upon reaching dive depth
- ☐ C. While diving, even if depth is constant
- ☐ D. All of the above

7. Which one of the following exposure suit configurations will result in the greatest loss of buoyancy at a depth of 100 feet:

- ☐ A. A 1/4 inch wetsuit
- ☐ B. A 1/4 inch drysuit
- ☐ C. A 1/16 inch neoprene drysuit with woolly undergarments
- ☐ D. A 1/4 inch drysuit with woolly undergarments

8. A diver with his equipment, including 17 pounds of weight, weighs 224 pounds; and the diver is neutrally buoyant in salt water. Approximately how much weight will the diver need for neutral buoyancy in freshwater? (Assume the volume of the weights to be zero.)

- ☐ A. 10 pounds
- ☐ B. 11 1/2 pounds
- ☐ C. 13 pounds
- ☐ D. 14 1/2 pounds

9. Arrange the following answers into the order in which buoyancy adjustments should be made:

- ☐ A. Amount of weight worn
- ☐ B. Amount of air in the lungs
- ☐ C. Amount of air in the BC

10. Divers who have difficulty maintaining neutral buoyancy usually experience problems:

- ☐ A. During descents and ascents
- ☐ B. During descents and bottom excursions
- ☐ C. During bottom excursions and ascents
- ☐ D. Throughout the dive

Scuba Quiz

Answers: Buoyancy Control

1. There is no correct answer, because all of the factors mentioned affect a diver's buoyancy! The one with the least effect, however, is water temperature. Colder water is denser, but the change resulting from surface to depth as far as buoyancy is concerned is very slight. There are five to six pounds of air in a scuba tank, which is why a skin diver needs more weight than a scuba diver and why a scuba diver's buoyancy changes during a dive.

2. B. Inflated with normal breath. When vertical, motionless and with the BC deflated, a diver holding a normal breath should float at eye level when weighted correctly. The same diver should then sink within a few moments after a full exhalation for a further test of proper weighting.

3. A. Swimming resistance and B. Rate of change of buoyancy with depth. Overweighting is compensated with air in the BC. This elevates the head of the diver, while the weight pulls the mid-section down. This decreases equipment comfort and increases the frontal area of the diver, requiring more energy for swimming. The air in the BC obeys Boyle's Law. The more air in the bladder, the more it is affected by pressure changes.

4. A, B, and C. Underweighting is hazardous. When an ascent cannot be controlled, a diver can get bent or suffer an air expansion injury. Fighting to stay down can lead to air starvation and panic. Accidents have occurred when underweighted divers have struggled to descend, drifted upward and embolized. Buoyancy must be an ally, not an opponent.

5. D. The planned depth and at 10 feet. This is a bit of a trick question because a diver must adjust weight for a single depth. So, how can weight adjustment for two depths be achieved? By using a descent/ascent line and by having extra weights available at the safety stop depth. Obviously, it is essential that the line be used for the ascent.

6. D. All of the above. Buoyancy control requires constant attention. Changes in depth, depletion of air from the tank, lung volume owing to activity and items collected all affect a diver's buoyancy. Good divers are quick to sense buoyancy changes and make small corrections. Less astute divers react less quickly, typically make excessive changes and demonstrate difficulty with control.

7. D. A ¼ inch drysuit with woolly undergarments. The greater the compressible volume, the greater the loss in buoyancy. The foam suit with fluffy underwear compresses most. A suit of thin, non-compressible material with undergarments as incompressible as possible are recommended from the standpoint of buoyancy control.

8. B. 11½ pounds. The neutrally buoyant diver displaces 3.5 cubic feet of saltwater (224 lbs. ÷ 64 lbs./cu. ft.). In freshwater, the diver displaces 218.4 lbs. (3.5 cu. ft. x 62.4 lbs./cu. ft.), so the diver will need about 5½ pounds less weight (224 - 218.4 = 5.6 lbs.) than is required for saltwater diving. Thus, buoyancy adjustments are a necessity when diving in water of a different density than that for which a diver's weights are adjusted.

9. A, C, B. Think of the amount of weight as the coarse adjustment for buoyancy, the air in the BC as the medium adjustment, and the air in the lungs as the fine adjustment. A good diver gets close to neutral buoyancy with the weights and the BC, then maintains neutral buoyancy with breath control. A difference of several pounds of buoyancy can be obtained by breathing with the lungs nearly filled as opposed to near-empty lungs. The breath isn't held, the average volume is varied as needed. Some divers never learn this skill.

10. D. Throughout the dive. As previous answers have indicated, buoyancy is not constant while diving. A person who has difficulty with buoyancy control can hardly have an enjoyable dive. Hovering motionless between the bottom and the surface next to a visual reference (no contact) is a good exercise to learn control of buoyancy through BC use and lung volume control. All divers should be able to hover without moving for a full minute.

With so many variables, is continuous buoyancy control really possible? It certainly is. Just watch a good diver on your next dive. He or she will be in constant control and make it appear effortless. The key is knowledge coupled with experience. If you have buoyancy control problems, I hope you learned something from this quiz and can apply the information on your next dive. Buoyancy control instruction is also part of the new refresher courses being offered. If you need help with your buoyancy, this is an excellent way to get it.

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photo by Mike Massey

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NORTHEAST SHIPWRECK CLEARINGHOUSE

In an effort to stop vandalism and alert the public to the importance of historic shipwrecks, the Peabody Museum of Salem, MA has initiated a Shipwreck Clearinghouse. The Northeast Shipwreck Clearinghouse will serve as a centralized source of information: It will alert the public to the overall significance of shipwreck sites. To sport divers who have already located and perhaps removed artifacts, the clearinghouse will offer advice for continuing research and preservation, as well as suggestions for determining a site's potential historical and archaeological value. Anyone seeking information about the Clearinghouse or its services should contact Dr. Paul Johnston, curator of the museum's Maritime History Dept., Salem, MA.

In conjunction with this effort, the Northeast Marine Advisory Council (NE-MAC) has recently published a booklet entitled *A Sport Diver's Handbook for Historic Shipwrecks: Tools and Techniques*. Those interested may acquire the book from the museum shop.

ISELL JOINS FISHEYE

Underwater photographer Marcus Isbell has joined Fisheye Photographic Services of Grand Cayman in the capacity of chief divemaster, boat captain and U/W photo instructor.

Isbell will be involved in all aspects of Fisheye's operation, including photo instruction, film development and retail sales in addition to his divemaster duties.

For full details of all Fisheyes' photo services, contact Fisheye Photographic Service, P.O. Box 2123, Georgetown, Grand Cayman, B.W.I.

DIVING TECHNICIAN PROGRAM

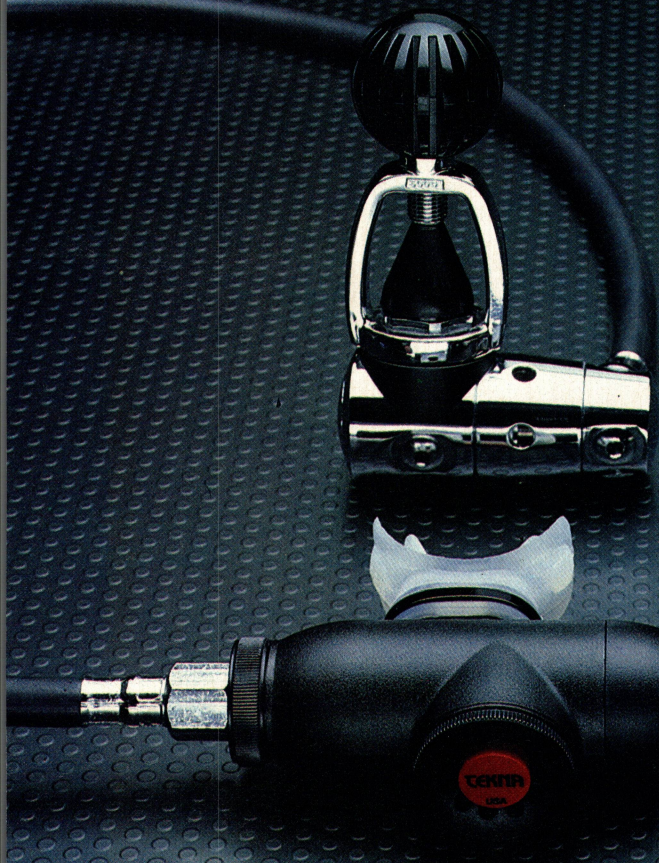
Highline Community College in Midway, WA is offering a seven quarter (two years plus summer session) course leading to an associate in applied science (AAS) degree as a diving technician. (Recent graduates are employed as life support and diving personnel in marine construction and commercial diving.)

The college owns and operates a dive facility on Puget Sound close to the campus, and students are trained in decompression/treatment procedures, practical operation of environmental control and life-support systems used in saturation diving, underwater welding and cutting, rigging, seamanship, salvage and U/W blasting.

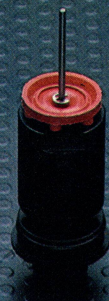
For more information contact Maurice Talbot or John Goolsby, Highline Community College, Midway, WA 98032-0424.

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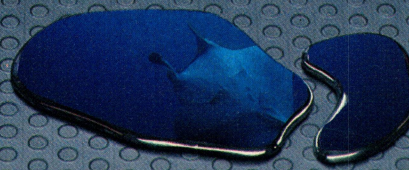
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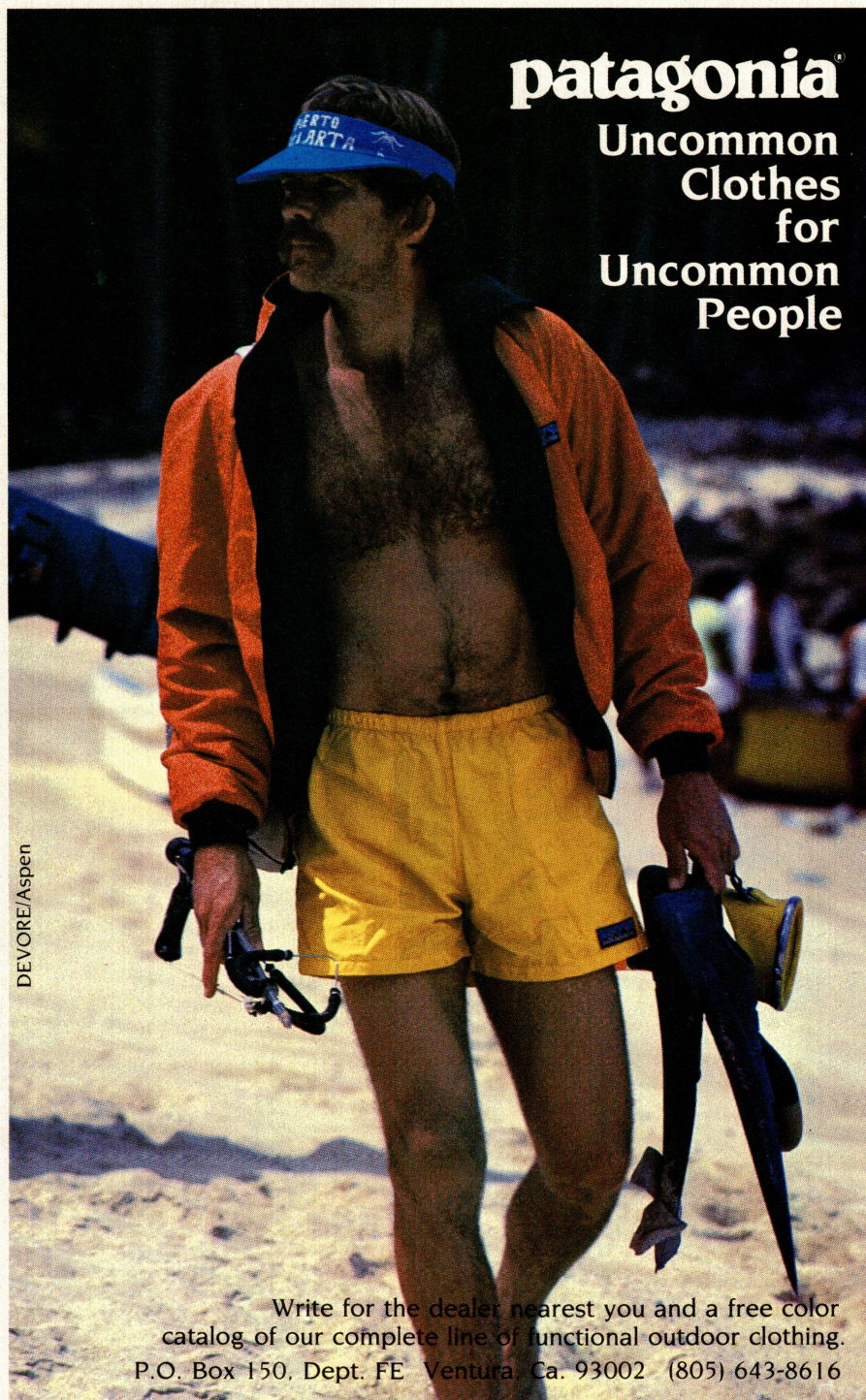
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CANADIAN TREASURE HUNTERS ASSOCIATION

The Canadian Treasure Hunters Association is accepting memberships from treasure hunting clubs and individuals throughout Canada and the U.S. For further information contact Canadian Treasure Hunters Association, c/o Wayne Ventry, 101-207 White Oaks Court, Whitby, Ontario, Canada, L1P 1A1.

FEMALE PDSNY GRADUATE

The Professional Diving School of New York has graduated its first female student, Julie Koeppen. Koeppen was a student in PDSNY's Life Support Technician program. The LST program stresses the topside life support aspects of commercial diving and medical hyperbarics.

The school reports that Koeppen has returned to her home state of Indiana where she intends to follow a career as a hospital chamber operator.

SCUBA SKILLS UPDATE

Scuba Schools International is offering a new program for diver safety. The SSI Scuba Skills Update is a refresher experience for the already certified diver. The Update is a one day program that includes classroom discussions and a water review of important diving skills.

Recognition of completion is displayed in the form of two dated stickers, one for the diver's certification card and the other for the log book.

For more information about the Scuba Skills Update contact: Scuba Schools International, 2619 Canton Court, Fort Collins, Colorado 80525.

PADI GROWTH

In 1982 PADI Headquarters reported growth in all areas, including numbers of divers certified and the number of facilities participating in the PADI program.

With a less than five percent increase in instructors, PADI diver certifications grew by 22.2 percent. Additionally, membership in Diving Ventures International, the PADI Diving Society, increased by 65 percent over 1981. PADI certified over 154,000 divers during 1982.

The number of PADI international training facilities also grew during 1982. More than 700 professional retail facilities throughout the world were participating in the PADI training facility program by the year's end.

CALIF. SWAP MEET

The Santa Ana College Dive Club is sponsoring its Fourth Annual Divers Swap Meet. The event will be held at the college, 17th and Bristol St., in Santa Ana, CA from 9 to 2 September 18.

The swap meet will be held at the pool so equipment can be tried. For information contact: Jim Taylor, 22011-J Rimhurst Dr., El Toro, CA 92630.

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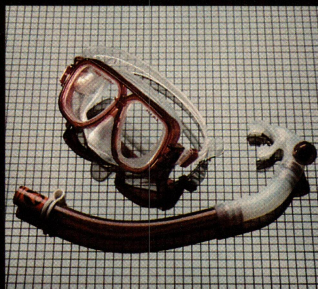
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The new TABATA LITE fin is the only clear fin with vents for reduced leg fatigue. TABATA has designed the fin for maximum propulsion by channeling the blade to prevent cavitation. The foot pocket is rounded for maximum comfort and has an adjustable heel strap. The LITE FIN is virtually indestructible, impervious to ozone and guaranteed not to rip or tear.

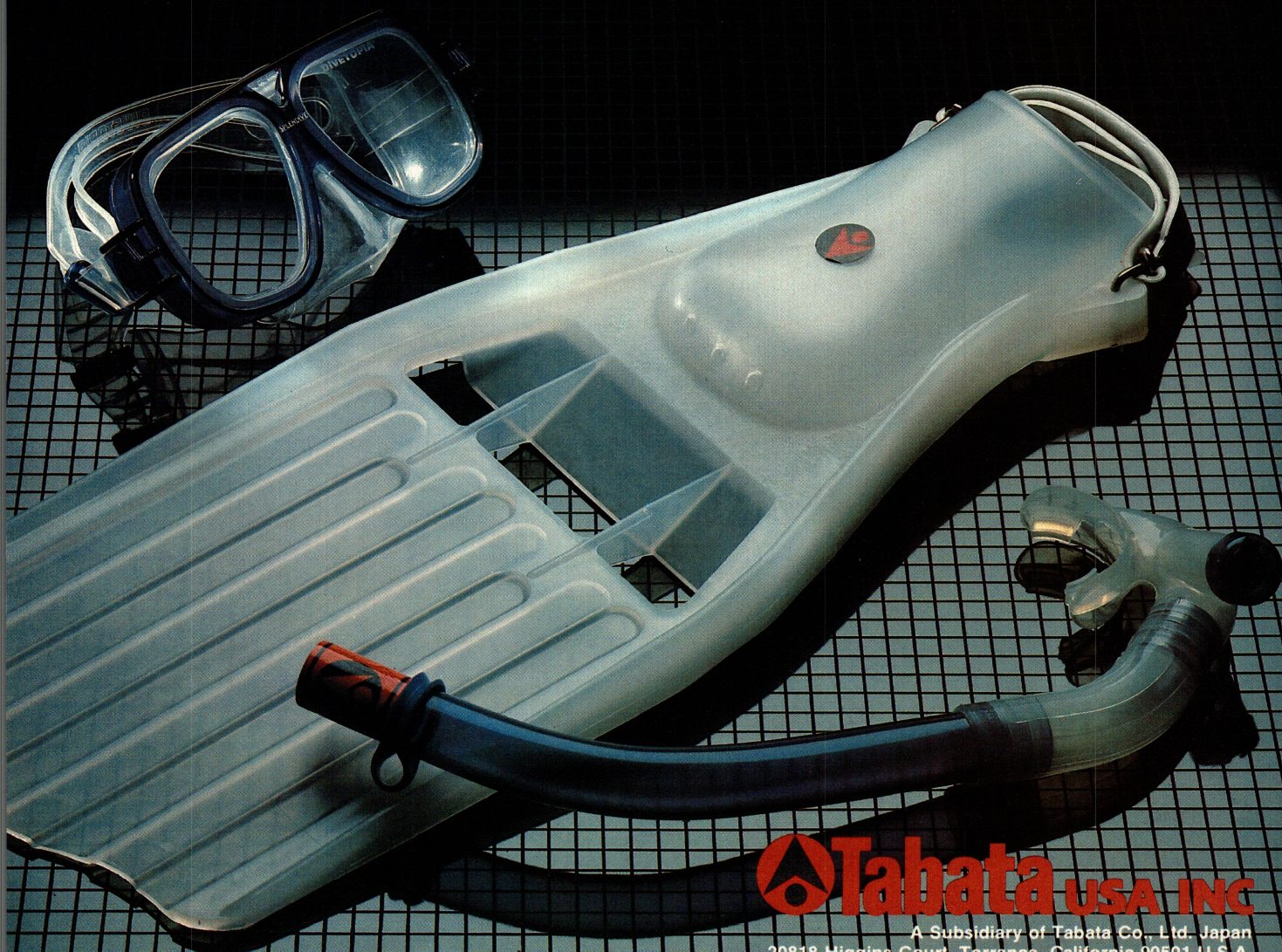
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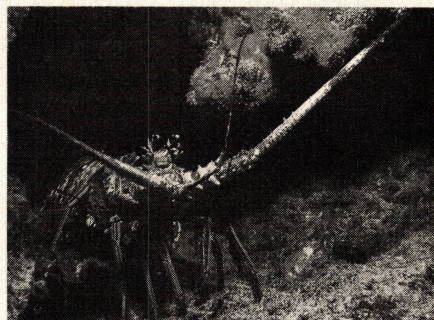
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DIXIE LOBSTER HUNT

Dixie Divers, Inc. is sponsoring the Fourth Annual Lobster Hunt on July 20 and 21. Competition will be held at both DDI locations (Fort Pierce and Stuart, FL)



photo/Stephen Frink

and thousands of dollars in prizes will be awarded. All entrants will receive free air. There is no entry fee required, but you must preregister.

For information and registration contact Dixie Divers, Inc., Lobster Hunt, 1717 South U.S. #1, Fort Pierce, Florida 33450.

COLORADO DIVING CHAMPIONSHIPS

The 26th Annual Colorado Diving Council Skin and Scuba Diving Championships will be held August 27-28 at the public boat dock, Grand Lake, Colorado. Events will include a treasure scramble, obstacle course, underwater swim, U/W navigation and others. Trophies, plaques and medals will be awarded.

The entry fee is \$15 per contestant (\$10 for preregistration) and \$10 for each team. For information and/or registration contact Kenneth Fox, 1923 Berkeley, Pueblo, CO 81004.

YMCA SPRING SESSION

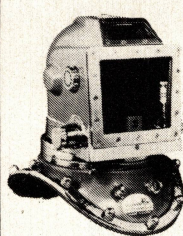
The National YMCA Underwater College in Key West, Florida will conduct a spring session in June for the convenience of those who wish to prepare for a summer or a lifetime of leadership in underwater activities. The session will present a series of courses which may be taken singly or as a combination, depending upon the interests and background of the individual concerned.

For further information contact: National YMCA Center for Underwater Activities, P.O. Box 1547, Key West, FL 33040.

MAKO/CASA BERTMAR

Mako Compressors has appointed Casa Bertmar Diving Resort as distributor of its complete line of compressors.

Capt. Kent Eldemire and Capt. Wayne Hasson have just completed the Maintenance and Overhaul Service School at Mako's headquarters in Ocala, Florida, and will be supervising any service or repair work on its compressors.



LOOKING FOR ADVENTURE? HIGH PAY? GET INTO DEEP SEA DIVING



No other career offers the international adventure and excitement of deep sea diving. Besides, if you're already diving, why not make a career of it!

And the pay for well-trained deep sea divers is high — about \$200 a day on the West Coast to about \$125 a day in the East. Pay is still higher for work overseas where the demand for qualified deep sea divers is growing rapidly. You can literally pick any part of the world where you want to work.

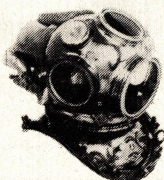
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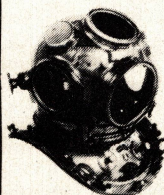
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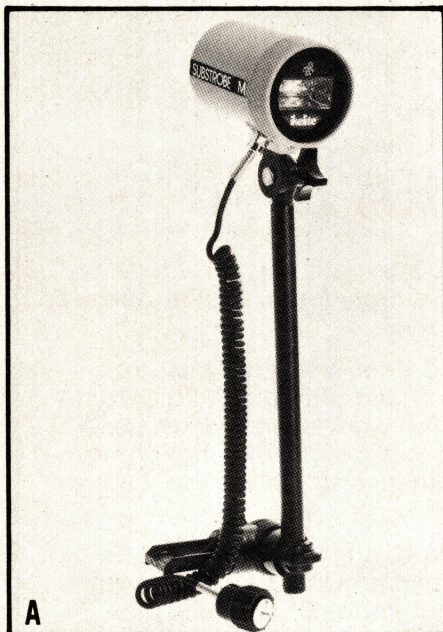
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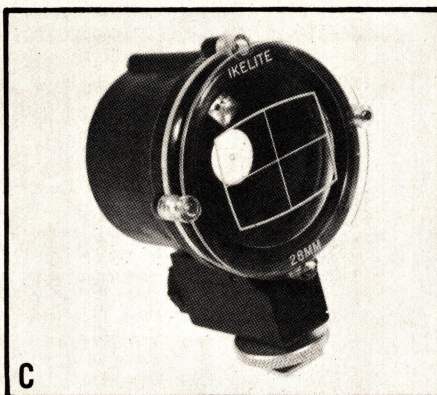


A — SUBSTROBE M & MA

Incredible value and capability in a small convenient size. Excellent coverage for a 28mm lens and superb for macro work. An honest 6 second recycle time, up to 300 flashes with four "AA" batteries, a true underwater guide number of 45 (ASA 25) and a realistic price. The Substrobe MA adds slave and/or fully automatic exposure control to these impressive capabilities. Shown with the versatile and inexpensive Strobe Mount I which allows almost unlimited positioning of the strobe.

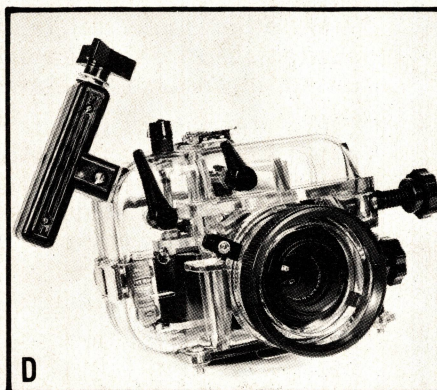
B — MINI C-LITE

Brightest of all the small flashlights and virtually indestructible. A rotating on/off switch allows easy one hand control. The intensity and compact size is delightful. An optional #1056 holster is available for mounting on strobes or any belt up to 2" wide. Mini C-Lite I produces 4-6 hours of light with four "C" cell alkaline batteries (not included). The Mini C-Lite II, includes a charger and ni-cad batteries producing about two hours of constant intensity between charges.



C — OPTICAL VIEWFINDER

This simple, but accurate viewfinder offers fine optics, parallax correction, and masks for 50mm to ultra-wide lenses. The 20mm mask is ideal for use with the Nikons 15mm lens.

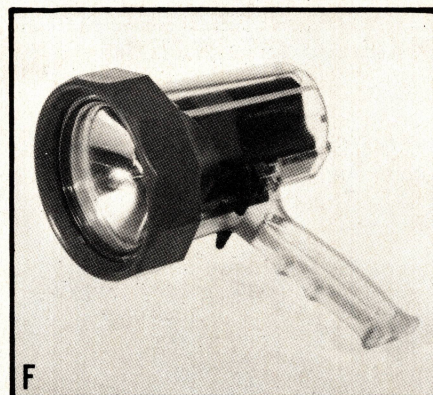


D — IKELITE SLR CASE

The 35mm Single Lens Reflex camera is the most versatile system in the world both above and below water. Combined with the Ikelite SLR Case, they both offer through-the-lens viewing and focusing, no parallax problems, built-in meters, multi-shutter speed selection and interchangeable lenses at realistic costs.

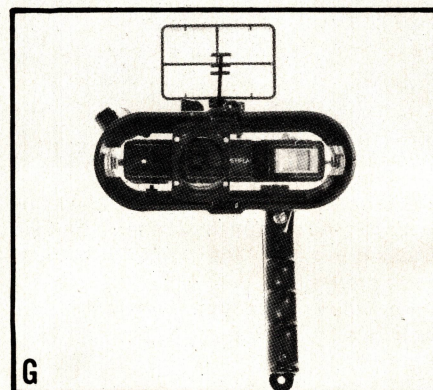
E — ICS/NIKONOS IV CONNECTOR & HANDLE

The ICS/Connector Console is a combination connector and tray; includes a battery compartment, 3 strobe bulkheads, and accessory mounting points. The Handle provides a second strobe mounting point plus an adjustable sure grip strap for camera comfort and easy access to shutter and film advance controls.



F — IKELITE II

The total concept of this light is simplicity in design and trouble free performance. The Ikelite II features a unique on/off switch, switch lock, floats bulb up, and is guaranteed unbreakable. Available in a super bright rechargeable model.



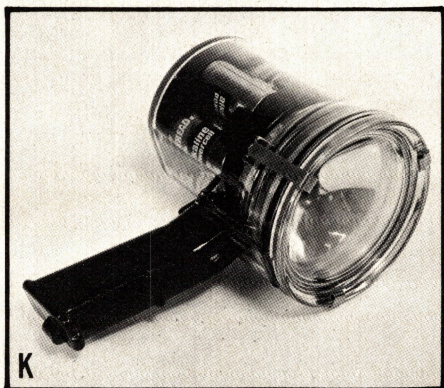
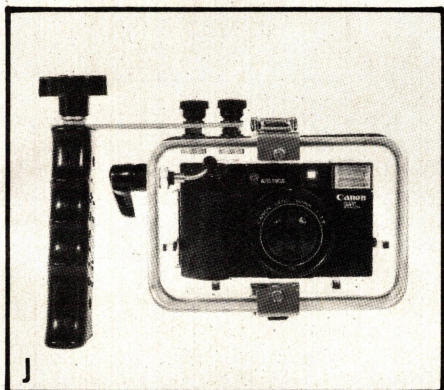
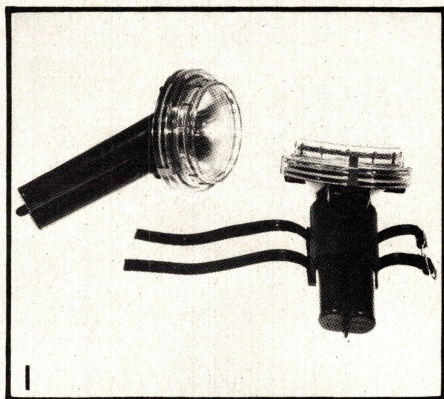
G — TRIMCASE

Underwater photography has never been so simple and inexpensive. The Trimcase, Close-up Lens, and Sportsfinder allow the 110 photographer to get excellent underwater photographs. Cameras with built-in flash and motor winders are extremely simple and easy to use.



H — SUBSTROBE MS & STROBE HANDLE

Substrobe MS is a slave unit (no cord) with the features of the Substrobe M. The Strobe Handle is ideal for macro photography and can be carried on a lanyard or mounted to the Strobe Mount I or II.



I — C-LITE II

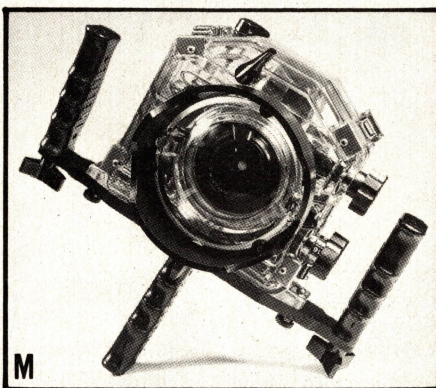
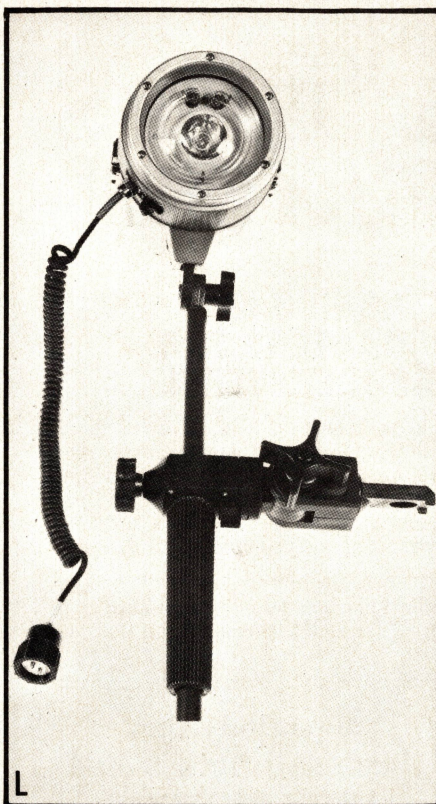
One of the brightest rechargeable lights in the diving industry. The special ni-cad batteries provide a constant intensity for about 1½ hrs. between charges. The compact size and unique shape is comfortable to hold or fits optional #1055 C-Lite Holster.

J — RANGEFINDER HOUSINGS

Rangefinder cameras can produce excellent underwater photographs almost automatically. Several camera models such as the Canon AF35ML include auto film load, auto focus, auto exposure, auto winder, built-in flash, and a quality lens.

K — MODULAR X LITE

The modular X Lite utilizes a powerful bulb and six "D" cell alkaline batteries to produce an intensity equal to most of the rechargeable lights. This inexpensive light offers all the unique features of the modular light series and can be converted to a Modular Superlite or Movielite.

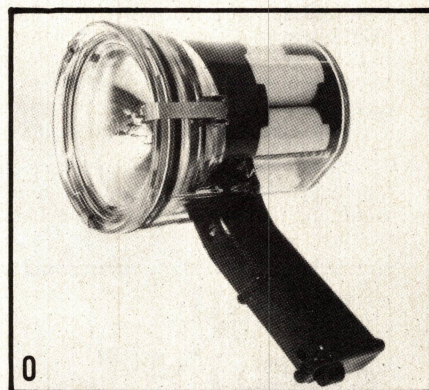


L — SUBSTROBE 150L & 150A

The new choice for serious underwater photographers because no other strobe offers these features and dependability at any price. The 150 covers 110 degrees with beautiful even coverage, and has an honest five second recycle time for each identical intensity flash. Interchangeable ni-cad battery packs with quick-charge capability provide up to 150 full-power flashes. Built-in aiming light, multi-power settings, built-in slave, true guide number of 60 with ASA 25, and a new interchangeable synch cord system. The Substrobe 150A adds a remote sensor with choice of manual, slave, and/or fully automatic exposure control. Shown with the superb quick-release Quick Mount I multi-adjustable arm system.

M — IKELITE SLR-MD CASE

This housing offers all the same capabilities as the Ikelite SLR Case, plus the added feature of using motor winder or motor drive.



N — IKELITE PRO COMPASS

Specifically designed for underwater use and the standard of the industry since 1969. The patented Pro Compass is fast reacting, stable and accurate. It can be worn on the wrist or in a console. The extremely luminescent face makes it easy to read at night or in dark water.

O — MODULAR SUPERLITE

Unquestionably the world's brightest diving light. The dual filament bulb provides unbelievable intensity for almost one hour on spot beam and two hours of lower intensity on flood. The rechargeable ni-cad packs can be interchanged in seconds or recharged in 3 hours. Converts to Modular Movielite.

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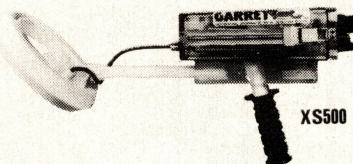
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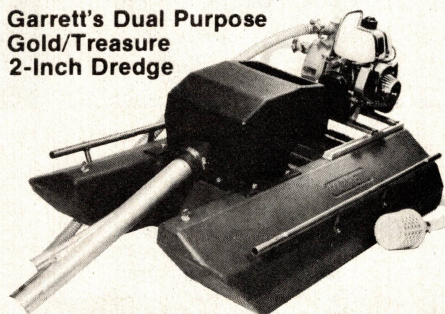
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IN MEMORIAM

BOB ALLEN



On January 28, 1983, Bob Allen, a pioneer diver in South Florida, died at his home in Ft. Lauderdale after a long bout with cancer. A veteran of 30 years in sport diving, Bob was one of the first to explore and map the reefs off Pompano Beach and Ft. Lauderdale, Florida. He remained active in diving until a year before his death.

Allen graduated from the Sparling School of Deep Sea Diving when it was owned and operated by E.R. Cross, current Technical editor for SKIN DIVER Magazine. After a stint at salvage diving, he moved to Ft. Lauderdale where he helped to invent and install a revolutionary new boat-docking device called Moor-Master that is still in use at many docks in South Florida.

SCUBALYMPICS

The 1983 Scubalympics will be held in New Iberia, Louisiana from August 6-14. The week long series of activities encompasses seven pool and five open water events using either snorkel or scuba.

The pool events, to be held at Land & Sea Sports, a PADI training facility, include: underwater bicycle, one fin and equipment recovery races; weightlifting; scubatics; speargun target shoot; and obstacle course run.

Open water events, to be held in a pond off Highway 90 East, include: 100 and 200 meter dashes; 400 and 800 meter relays; 800 meter snorkel race; 50 meter compass course dash; and 50 meter compass distance marker race.

A special two-day, ten event scubacathlon will include both open water and pool events.

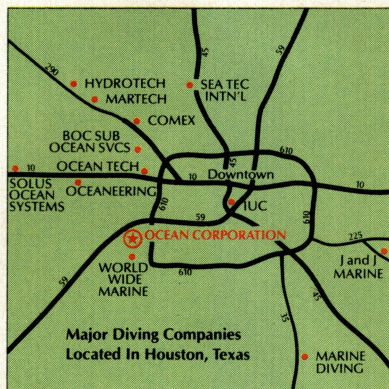
To register for Scubalympics, obtain an application from either your nearby PADI training facility or Land & Sea Sports, Inc., 802 Weldon, New Iberia, LA 70560, (318) 367-9268.

Scubalympics is open to all certified scuba divers 18 or older (15 with parental consent). Registration is \$25 per event and each contestant may sign up for two pool and two open water events. Points will be given for each event won and those with the most points can win tropical dive trips, dive gear and money.

Why Houston?

BECAUSE

The Ocean Corporation is located in Houston and more commercial divers are hired in Houston than in any other place in the world. Twelve diving companies are located in Houston including three of the four largest in the U.S. Many others are located in the nearby New Orleans area. The demand for divers is so great in Houston that large locally based diving companies like Ocean Systems, Hydrotech Systems, Martech International and Sea Tech International have hired many of our students for part-time work while they were attending school. Over 90% of our recent graduates went to work for these and other local diving companies when they completed our program. Houston is the place where the action is...the commercial diving, offshore construction and oil industry capital of the world.



BECAUSE

The Ocean Corporation is a commercial diving company, not just a school. Our facilities, equipment and training aids are the best, and our diving systems are as up-to-date as possible...

because much of the equipment is used by our diving operations division to perform actual diving contracts in the field. Ocean Corporation has successfully completed many underwater jobs for various industrial clients over the years...including specialized underwater inspections, maintenance and repair work. For example, we did the world's first commercial underwater repair job in a nuclear power plant. And most of our divers have been graduates of our own school.

BECAUSE

The Ocean Corporation is a convenient and exciting place to go to school. Houston is one of the fastest-growing and most dynamic cities anywhere. It is a city of expansion, energy and youth (the average resident's age is in the mid-20's). Houston offers every conceivable kind of entertainment, from sports events, ultra-modern discos and open-air theater to rough-house local rodeos, chili cook-offs and the new Texas-size



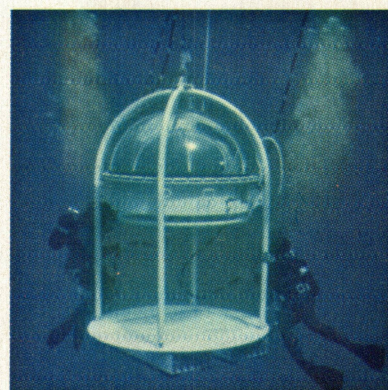
country-western dance clubs. Reasonably priced adult and singles apartments are readily available within walking distance of the school, and fast-food to luxury restaurants are nearby. The semi-tropical climate is wonderful, the sport diving is great and the folks are friendly.

BECAUSE

The Ocean Corporation management and instructor staff have long-term experience in the international offshore oilfield diving business. Retired ex-military divers and sport scuba divers don't run the school...commercial divers do. For example, the President of The Ocean

Corporation, Larry

Cushman, was Vice President and Europe/Africa Area Manager for Ocean Systems, Inc. for three years...with responsibility for all North Sea diving and underwater construction operations. He also worked six years as a manager for Oceaneering International, Inc., another of the world's largest commercial diving contractors. Ocean Corporation managers and instructors know today's diving business...first-hand, from recent experience.



The Ocean Corporation

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Freeport's Super

A full-page photograph of a diver in deep blue water. The diver is wearing a mask and fins, and is surrounded by a large cloud of bubbles. In the background, the structure of a shipwreck is visible, partially obscured by the water's depth and light.

Divers descend on Theo's Wreck, Freeport, Grand Bahama. The ship was purposely sunk here to provide a wreck for divers and an artificial reef for fishermen. The project was a collaboration of the Underwater Explorer's Society and the Bahama Cement Company.

Wreck

Steel Freighter Perched on Edge of Drop-off Provides New Thrill For Divers

TEXT AND PHOTOGRAPHY BY STEPHEN FRINK

There is something very special about an underwater shipwreck. Perhaps it is the aura of mystery surrounding its sinking, or concern for the hapless sailors who might have lost their lives in the disaster. Perhaps it is the lure of potential booty to be found within the wreck, whether in the form of golden doubloons or brass portholes. Or maybe it's just the appreciation the sport diver develops for the magnificent artificial reef the wreck soon becomes. Bland, monochromatic metals take on the multiple vibrant hues of the encrusting corals and sponges. Fish begin to congregate in large numbers seeking shelter and sustenance, and the dead, empty hull is transformed from a chunk of scrap metal to a thing of living beauty.

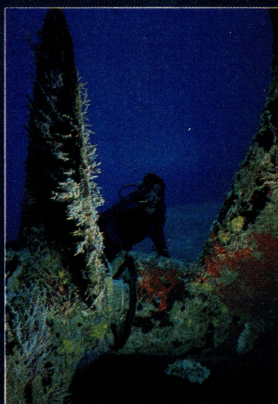
In Freeport, Grand Bahama such a transformation is currently occurring owing to the thoughtful collaboration of the Underwater Explorer's Society (UNEXSO) and Bahama Cement Company. In this case, mystery and sunken treasure are not the principal lures. Pragmatic economic realities brought this ship to her watery doom.

The vessel was built in 1954 in Norway and christened the *M/V Logna*. She was an impressive ship with a 228 foot length and 35 foot beam, and for 15 years she plied the waters between Norway and Spain transporting cargo. In 1969 the Bahama Cement Company purchased her and converted her to their special requirements. Drag scrapers and pneumatic discharge systems were installed to facilitate transferring dry cement from the hold to shore. Typically she would carry cement from Grand Bahama to New Providence and Eleuthera, and bring sand back from Florida to Grand Bahama to make concrete.

The cement business is hard on vessels however, and the ship required drydock maintenance every 12 to 18 months. Each trip to the yard cost between \$100,000 and \$250,000 to keep the ship in the Class A condition required by Lloyds of London insurance. By 1981 the hull had thinned sufficiently to require major renovation at an estimated cost of \$1,000,000. As a result, the rechristened *M/V Island Cement* became an economic liability which the Bahama Cement Board of Directors proposed dumping in deep international waters.

The marine engineer for the project, Theopolis Galanoupoulos, had been recently certified as a scuba diver by UNEXSO and was aware of the benefits the wreck would provide, both to scuba divers and sport fishermen, if sunk in shallower water. Consequently, he approached John Englander of UNEXSO,

(Continued on Page 72)



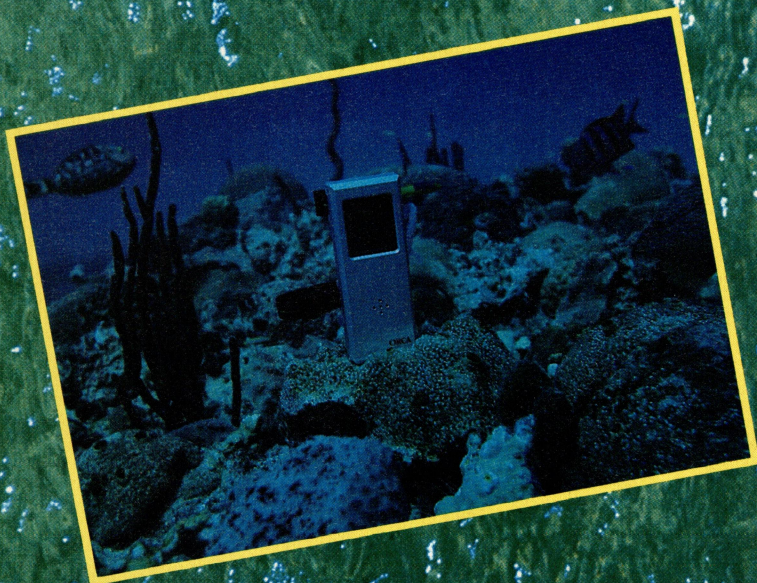
The propeller of Theo's Wreck. Below: Instructor Lou Fead signals to a diver in the UNEXSO training tank.



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Photos/Dianne Corbet

To Save A Whale Fossil

**Tropical Florida Lagoon
5 Million Year Old Fossils
To Go On Exhibit**

The skeletal remains of a five million year old baleen whale are being recovered from a shallow lagoon in a creek near Fort Myers, FL in the southwestern part of the state. The skeleton is 30 to 40 feet long.

After the fossilized pieces are removed from the creek, they will be transported to the Florida State Museum in Gainesville. Funds permitting, the skeleton will be restored for exhibit.

The creek where the whale skeleton was found runs through private property

owned by amateur paleontologists. (The couple has requested that neither their name nor the location of the site be made public in the interests of preserving it for careful excavation.)

A part of the whale's skull was first observed by a snorkeler, Chris Kreider, in the three foot deep creek in July 1982. The skull is six feet wide at the base and about nine feet long. Further digging under the sand and silt of the creek bottom revealed other bones. "People are always bringing us a vertebra or a piece of

mandible (lower jaw)," said Diderot Gicca, a paleontologist from the Florida State Museum in Gainesville. "It's rare to find a fossil in such complete and good condition." Gicca estimates that the whale died five million years ago. Researchers say that, at the time of the whale's death, the creek bottom was actually located in a shallow sea about 100 miles from land. They speculate the whale was either killed by sharks or preyed upon after its death because so many shark's teeth were found at the excavation site.

The skeleton is being excavated from the creek bottom through the cooperative efforts of the Nature Center of Lee County, Florida, the Florida State Museum and 3M, which donated Scotchcast tape and technical assistance.

The bones of the whale, riddled with tiny cracks, tend to fall apart when moved. Conventionally, a fossilized skeleton is removed by digging a trench around the bones and wrapping the fragile or cracked portions with a plaster casting tape. In this case, plaster was not used because it deteriorates in water.

Instead, paleontologists are using Scotchcast tape. Introduced by 3M's Orthopedic Products Division in 1980, it is a knitted fiberglass impregnated with a polyurethane resin which hardens when exposed to water. Scotchcast casts are about four times stronger than comparable plaster casts and are about one third lighter. The tape is applied with the same techniques used to make conventional plaster casts.

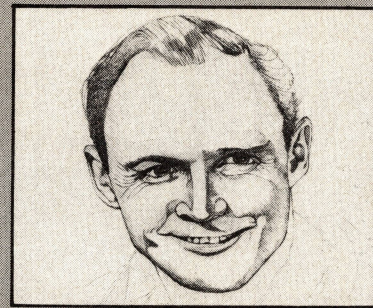
The temperature of the creek allows 17 minutes before the cast material sets. That is enough time for paleontologists to swim down to the bones and wrap pieces together before the tape hardens. After the fossil pieces are delivered to the museum 250 miles away, the tape will be removed with a medical cast saw.

Whether or not the whale will be assembled in a museum is still uncertain. The main roadblock is lack of funds; it could cost up to \$100,000 to reassemble the skeleton. To prepare the whale for exhibit, each bone has to be filled and repaired with papier-mache material to make the bone whole. In addition, each bone has to be drilled so that a brass rod can be inserted for strength. (Contributions from the public can be sent to Restore the Whale, Florida State Museum, University of Florida, Gainesville, Florida 32611.)

Paleontologists also have discovered at least two other geologic layers containing artifacts and fossils at the site. One layer, estimated to be 2500 years old, contains pieces of Indian pottery, beads and worked bone. Another layer, determined to be 10,000 years old, has revealed the bones of a giant beaver, deer, elephant, camel, sloth, extinct horses and several other species. 

Technifacts

BY E.R. CROSS



The basic purpose of this column is to stimulate an interest in the technical aspects of diving and dive safety. It will be devoted to providing factual answers to questions from SKIN DIVER readers. Comments, questions and suggestions received from Ken Simmons, Houston, TX; Russell A. Philbrick, Malibu, CA; Bernard J. Murphey, Worcester, MA; Captain M.C. Sibitzky, USN (Ret.), Port Angeles, WA; and James Parnell, San Diego, CA are deeply appreciated.

UNITED KINGDOM DIVING

In the November 1982 Technifacts, we quoted a letter from a Mr. Glassman in which he stated that in Britain one (decompression) table with one layout was used. In the following paragraph we stated something to the effect that in Britain there is only one major dive organization, known as the British Sub-Aqua Club. Mr.

Glassman then went on to tell about various branches of the BSAC.

A letter was recently received from Mr. J.M. Twilley who wrote: "The first and major error is the statement that, 'In Britain there is only one major dive organization.' There are, in fact, three. The oldest one is the British Sub-Aqua Club. The other major group is the Sub-Aqua Association. The significant difference between the two is that whilst the BSAC is nominally a single club with quasi-autonomous branches, the SAA is basically a liaison organization which co-ordinates the voices, the training programmes and standards of the many completely independent diving clubs in the U.K. The third, and rather smaller major body is the Scottish Sub-Aqua Club (SSAC), which is similar in constitution to the BSAC, but exclusively a Scottish club."

Mr. Twilley continued, "There is also an organization, Comhairle Fo-Thuon, the Irish Underwater Council (IUC), whose headquarters are actually in Northern Ireland but which I believe is the overall organization for Ireland. The BSAC has arrogated the title of 'Governing Body for the Sport' in the U.K., but this is hotly contested by the other main groups. The actual split of membership in England and Wales is probably about 50 percent BSAC; 40 percent SAA; and 10 percent independent. In Scotland it is probably more nearly 35 percent SSAC; 25 percent SAA and 5 percent independent."

According to Mr. Twilley, "As regards the recognition of diving schools, it is true to say that the BSAC recognizes some of them as offering training acceptable to the club; so does the SAA. But I cannot

(Continued on Page 43)

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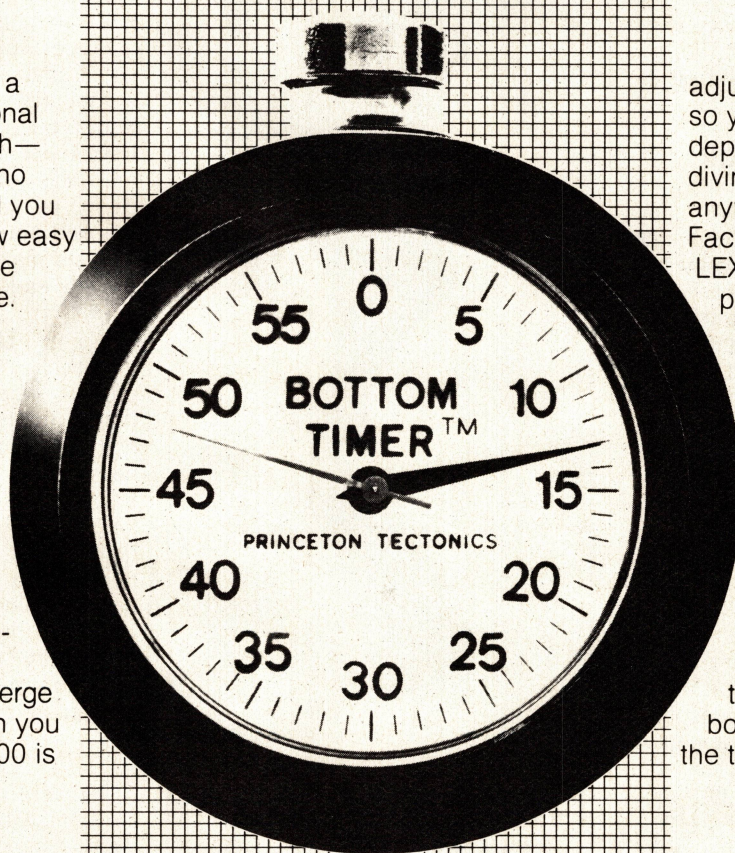
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Buoyancy control is a source of frustration for many divers. Underweighting may cause you to thrash about on the surface when you attempt to descend. Underwater, you may have to pick up rocks or hold onto such things as kelp to keep yourself from continually floating upward. On ascent, you risk air embolism or the bends from rising too rapidly.

Overweighting also causes problems. Although it will get you to the bottom quickly, ear equalizing may be impossible and a crash landing on all fours won't add much to your dignity. Also, no dive is enjoyable if you have to fend off the bottom constantly.

NEUTRAL BUOYANCY

Every basic scuba student is taught to weight himself/herself for neutral buoyancy at the surface. If you are neutrally buoyant you will float at eye level with a normal breath in your lungs while wearing full scuba gear. To achieve this with a full, one-quarter inch wetsuit the rule of thumb is: The amount of lead on your weightbelt should equal ten percent of your body weight. Fresh water divers will need 10 to 20 percent *less* weight because fresh water is less dense than salt water and people are less buoyant in it. Remember, this is just a rule of thumb. People of the same height and weight will not necessarily have the same buoyancy. Although we know that the more body fat you have the more buoyant you will be, there are some people who are significantly more or less buoyant than others of similar build for no obvious reason.

Basic students usually manage neutral buoyancy during certification class, but the first few dives afterward they find themselves either under or overweighted. This is usually owing to a change in some or all of their equipment. A newer wetsuit may be more buoyant than an older, rental one because newer neoprene is lighter than its older counterparts: It is composed of less rubber and more air. Although there isn't a lot of difference in the buoyancies of steel or aluminum 72s when empty (both are about three and one-half pounds positive), there is a difference between the 72s and an aluminum 80. The latter is nearly five pounds positive when empty. If you are going to be diving shallow (less than 30 feet) you would be wise to remember this and compensate for it. Otherwise, at the end of your dive when your tank is low on air, you might find yourself more positive than you want to be. This means that you are probably going to be slightly overweighted instead of neutral at the beginning of your dive.

Buoyancy will also change when you switch to a different thickness of wetsuit. The thicker the neoprene, the more buoyant you will be. If you dive without a wet-



photo/Bonnie J. Cardone

The Ups & Downs Of Buoyancy Control

BY BONNIE J. CARDONE

suit you should need little or no weight.

You will also become more buoyant when you wear a drysuit. This is because there is a layer of air inside the suit (as opposed to a layer of water in a wetsuit) that keeps you warm. You must compensate for this air with extra weight—often ten or more pounds of it. For example, in a one-quarter inch wetsuit I need 12 pounds of weight with a steel tank, but in my drysuit I need 22. Part of this weight I wear around my ankles in the form of three and one-half pound (each) ankle weights. These are soft and comfortable and make the extra pounds easier to carry. Anki•Weights (made by Durward Industries of Canada) provide some inter-

esting bonuses: They help keep air from collecting in attached booties; make feet first descents easier; and, give you better balance (because your weight is distributed more evenly) when you are swimming horizontally. Kicking is not any harder and the weights do not create noticeable drag. Although I have not used these with a wetsuit, they should be equally effective there, too. Anyone who does not like to carry all of his/her weight around the waist should try some type of ankle weights.

Proper weighting takes patience and a lot of trial and error. Add or subtract weight until you have achieved the buoyancy you desire. The new neoprene weightbelts made by several companies make this a bit easier. These have Velcro closed pockets that hold two or two and one-half pound cylindrical weights. The pockets make adding or removing lead weights easy.

USE YOUR BC

Buoyancy control is simpler if you are properly weighted, but that is not the only factor involved. The modern BC with dump valve and power inflator is a great help. When you find yourself too negative, just add a little air to your BC with a touch of the inflator button. If you accidentally get too much, vent it with the dump valve. Adding air can be dangerous, however, if you forget to vent the air when you begin to ascend. At a certain point a full BC will stop being a help and become a hazard. Be aware of this and be prepared to dump air as you ascend.

LUNG VOLUME

Dennis Graver considers lead weights the coarse buoyancy adjustment, air in the BC the medium adjustment and air in the lungs the fine adjustment in buoyancy control. (See this month's Scuba Quiz.) To demonstrate how this can affect you, try floating neutrally buoyant on the surface, then exhale as much as possible. You should begin to sink. Inhale and you will float upward. You can use this same technique underwater. Inhaling more than normal will make you more buoyant, exhaling more than normal will make you less buoyant. Of course, you must *breathe*, not just take a deep breath and hold it in your lungs.

CONCLUSION

Buoyancy control will not be accomplished on your first dive, it is a skill that has to be learned with the experiences gained from many dives. Divers should be constantly aware of changes in their buoyancy owing to equipment changes, depth or game collecting. Eventually, buoyancy control will become a second nature adjustment that you will make almost automatically. 



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POINT LOBOS

Northern California's Scuba Sanctuary
TEXT AND PHOTOGRAPHY
BY GLENN POLLOCK

Lobos opens at 9 am, but that's too late to arrive if you are planning to dive there on a weekend. Only 30 divers per day are allowed in, and at 6 am the cars start lining up outside the gate. By 7 the line extends out to the highway and all 30 spots are filled. Even so, the reserve is one of the most popular places to dive in Northern California.

A few miles south of Carmel, this peninsula derived its original name, Punta de los Lobos Marinos (Point of the Sea Wolves), from the sea lions that inhabit the offshore rocks. It was included in the California State Park system as Point Lobos State Reserve in 1953. With the advent of Scuba diving as a sport in the 50's and the popularity of the area for tide pooling and scientific collecting, the intertidal and marine resources rapidly dwindled. In 1960, to protect these resources, 775 acres of tidal and submerged lands were officially established as the nation's first marine reserve. The California Fish and Game Commission gave the reserve additional protection by granting it ecological reserve status in 1973, thus ending any further fishing or taking of marine life from the area.

The marine reserve is on the northern shore of the peninsula and includes two beautiful coves, Bluefish and Whalers. Diver and boat access is only allowed from a small concrete ramp in Whalers Cove. The location of the ramp on the western side of it guarantees a calm entry regardless of ocean conditions. Only the rise and fall of the ocean swells reach it. The cove itself is shallow and almost always murky. But the mouth is less than 200 yards from the ramp and beyond it the visibility increases dramatically as the bottom gradually drops off.

During the summer months the two coves and the surrounding coastal wa-

ters are covered with a thick canopy of kelp making it difficult for divers to reach the better dive spots without a boat or board. Still, most divers swim out on the surface, slowly winding their way through the tangle of kelp. But the long, tiring swim is well worth the effort, for the reserve contains some of the richest concentrations of sea life found in California. The thick kelp beds harbor and nurture millions of residents from the microscopic zooplankton to an occasional gray whale. Over 750 varieties of fish and invertebrate life, representing almost every class of marine animal, live within the shelter of these forests. Some 92 species of sea stars alone have been found here, ranging in size from the tiny six-rayed star to the giant sunflower.

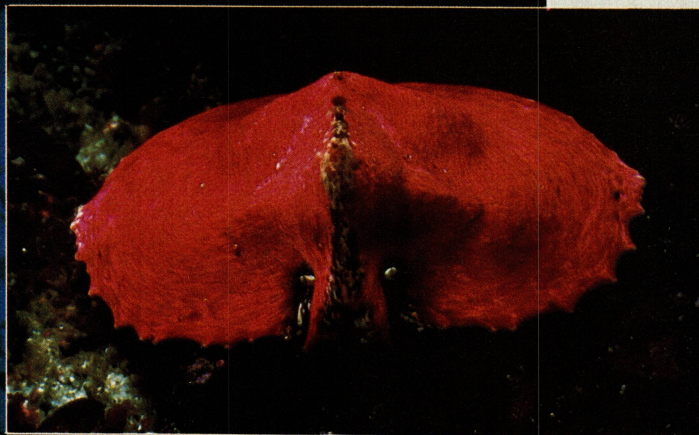
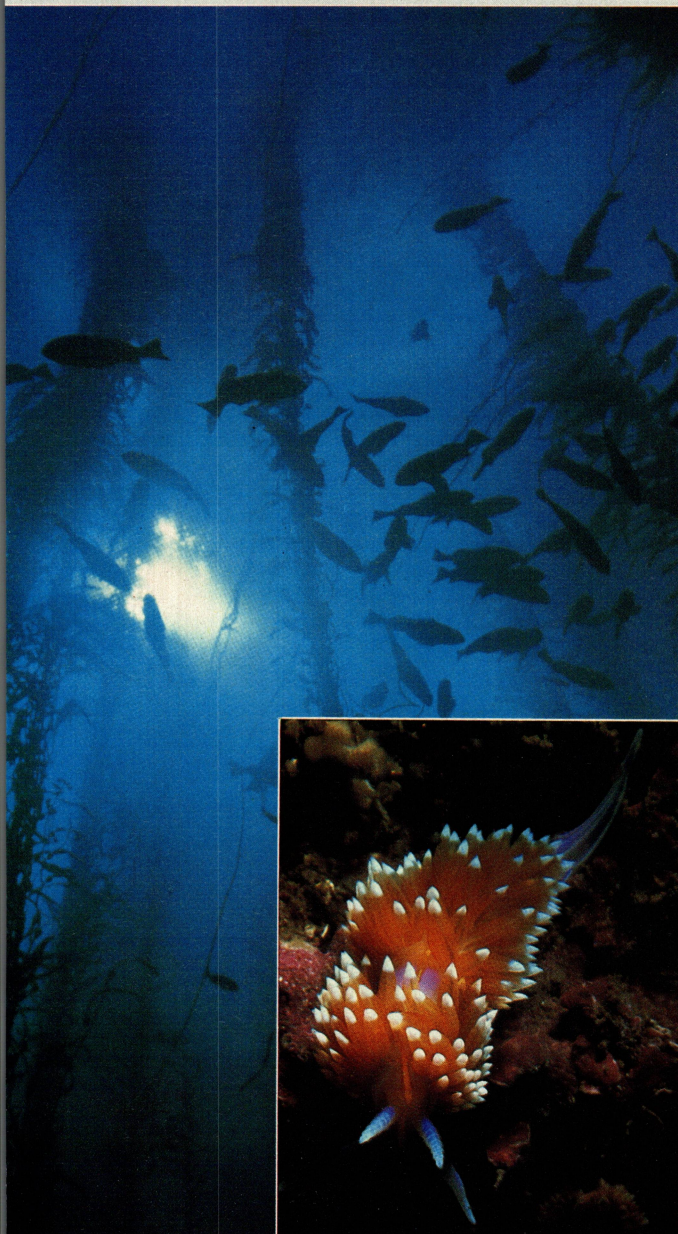
A number of marine mammals also make their homes in and around the reserve. While swimming out of the cove on the surface a diver might encounter a sea otter floating on his back among the blades of kelp. Although this five foot long mammal is often quite curious it is also very wary and usually will roll over and disappear below the surface before the diver can approach too closely. Occasionally the diver will be followed by a sea lion as he kicks out beyond the mouth of the cove.

When he drops below the surface canopy the diver may find himself drifting down through schools of blue rockfish and yellowtails as they hang motionless among the kelp stipes. Moving almost imperceptibly the fish will part to let him through, closing the gap above him as he passes. Continuing his descent into the rocky canyons the diver will notice the light gradually fading. The kelp canopy above him prevents more than 50 percent of the sunlight from penetrating the surface. This, plus the water's natural fil-

tration of light, make a dive light almost a necessity. Beyond a depth of 40 feet the canyon walls appear dark and gray until washed by a diver's light. Then they explode into a rainbow of colors.

This is a dive on which to linger, to drift slowly and observe the minute and colorful marine life encrusting the rocky walls. In these nutrient rich waters the competition for space is so fierce that not an inch of the granite substrate is left exposed. Scarlet red volcano sponges (*Acarnus erithacus*) vie for space with purple encrusting hydrocoral (*Stylianthea porphyra*). Lacy bryozoans (*Phidolopora pacifica*) crowd around the base of rare magenta California hydrocoral (*Allopora californica*). Tiny strawberry or clubfoot anemones (*Corynactis californica*) cluster together forming brightly colored colonies that sometimes reach more than a





Background: Fish silhouetted in a kelp bed. Top: A bright red umbrella crab. Above: Sea lemons (nudibranchs) and their egg mass. Left: A horned nudibranch. The ecological reserve at Point Lobos is a haven for marine life from small invertebrates to fish to marine mammals.

foot across. Often an individual plume worm (*Serpula vermicularis*) can be seen among the anemonies fighting to keep a foothold on the rocky reef. Members of another species of tube worm (*Endistylia polymorpha*) protrude from the cracks and crevices forming multicolored masses of plumes resembling feather-dusters, for which they are named.

The diver will quickly spot the sea lemons (*Anisodoris nobilis*) sprinkled about the underwater landscape looking like gigantic lemon drops. These dorid type nudibranchs are the most common in the reserve, and often their spiral egg masses can be seen gracefully swaying to the rhythm of the currents. If he is willing to patiently poke about under blades of seaweed or around lacy bryozoans the diver may be rewarded by finding many more species. The most common of the

aeolid type, the horned nudibranch (*Hermissenda crassicornis*), is easy to recognize. Its translucent body is lined with opalescent blue lines and its back, covered with gold tipped orange cerata. Further exploration will reveal the less common, but just as beautiful, Spanish shawl (*Flabellinopsis iodinea*). Its iridescent purple body and electric orange cerata make it easy to spot.

While he is absorbed in this minute world the diver might sense that he is being watched and feel a gentle tug on one of his fins, as if someone is trying to attract his attention. Turning, he will find a harbor seal looking over his shoulder, watching him just as intently as he was observing the nudibranchs. Like a playful puppy it might follow him for a while, circling and darting in and out. Finally it will lose interest, turn away, and effortlessly

wind its way through the kelp back up to the surface.

Returning his attention to the reef, as he drifts down toward the canyon floor, the diver will discover that the crevices gradually widen to form shallow caves near the sandy bottom. Here he will find individual tube anemonies (*Pachycerianthus fimbriatus*) protruding from the sand in parchment-like tubes, their golden tentacles swaying gently to and fro with the surge. He might find a sea hare (*Aplysia californica*) grazing on bits of algae, or a giant sunflower star (*Pycnopodia helianthoides*) feeding on an urchin.

The sea bed offers a new and different area to explore, but a check of his pressure gauge will tell the diver his time is up. The dive will have passed all too quickly and the sea bed must await a future dive. 

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TECHNIFACTS

(Continued from Page 36)

speak for the SSAC nor for the IUC. The SAA is also in active negotiation with PA-DI and is considering other training schedules..."

Regarding the use of decompression tables in the sport diving groups Mr. Twilley stated, "The second major misstatement is that, 'In Britain only one table with one layout is used.' Undoubtedly the table published by the BSAC is the most commonly used. However, there are many experienced divers who distrust this (metric) table, both for single dives and as a repeat dive table. The original, and very conservative, RN (Imperial measurement) table is still in common use for single dives; and many divers use the U.S. Navy tables for both single and repeat dive calculations."

In conclusion Mr. Twilley wrote, "It is probably pertinent that I make my own position clear. Firstly, although I am the editor of 'The Official Magazine of the SAA,' I am not an SAA member. Nor is Subaqua Scene, or Ocean Publications in any way financially connected with any of the U.K. dive organizations. Personally, I am a BSAC member, and have been for more than 20 years."

The preceding comments are appreciated. Technifacts does receive correspondence from U.K. divers. None of this previously concerned sport diving organizations; most of it dealt with commercial diving organizations and regulations.

SQUALUS RESCUE

The story Deep Rescue in December's SKIN DIVER prompted many letters that provided information on this event that occurred almost 44 years ago. Several of the letters will serve as input for the feature story on the salvage of the *Squalus* to appear in a future issue of SKIN DIVER. Others will be shared with Technifacts readers.

Martin C. Sibitzky made the first crucial dive on the sunken *Squalus*, locating the submarine escape hatch and attaching the downhaul cable for the rescue bell. Sibitzky was called Big Ski to differentiate him from John Mihalowski, who was only 5'4" tall. Big Ski wrote, "Congratulations on Deep Rescue, a well told story. In the picture on page 15, Mike (Little Ski) hasn't changed much. I visited two of the survivors, Alan Bryson and Gerald C. McLees, last fall. Also met diver Roland Fiedler who lives in Kittery, ME. Again, congratulations."

Another fan of SKIN DIVER Magazine and of John Mihalowski wrote, "As you probably know, John Mihalowski was born and grew up here in Worcester, MA and of course we were always proud of him. I was just 17 years old when the
(Continued on Page 66)

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So. Carolina River Diving

A Trip A Thousand Years Into History

BY WENDELL M. PATTON, III

My first attempt to descend had ended in what seemed total disaster. While floating on the surface I began fumbling with a myriad of imagined equipment malfunctions. It was then I noticed I was rapidly being swept downstream. That water was really moving! Visions of being pulled out to sea and lost forever danced through my head. I tried to swim back to the boat. There was absolutely no way. Panic started to set in. I headed toward shore which by this time seemed to be passing so fast as to be only a blur. My dive buddy, who was holding on to an overhanging tree, reached out and pulled me to shallower water. I shed my equipment and walked back to the boat, shaken and frustrated.

An hour later I tried again. As soon as I entered the water and began my descent, I could feel myself being rushed downstream again by the combined forces of the river current and the outgoing tide. The object now was to get to the bottom as quickly as possible, which was an admirable feat for me since I am as

buoyant as a helium balloon. This time I was not going to quit.

The water was dark—I couldn't believe how dark! I had to look directly at my dive light to tell if it was on. There was no sign of my dive buddy, yet I knew he was less than five feet away. I had never seen darkness so absolute. Feeling something bump my shoulder I reached out fearing the worst, only to find my unseen partner. The only thing visible was the very dim glow of his dive light, and I had to look very hard to see that.

I wasn't prepared for this, my first river dive. Oh, we had been well briefed by our guide on what to expect on this dive, during the three hour drive from our home in Columbia, SC, but now that I was experiencing it, I was, quite frankly, scared! My experience prior to this had been in a large lake near my home where there was 30 foot visibility and no current.

We were diving a rather narrow tidal river in the southeastern portion of South Carolina. As is the case with many of the rivers in this part of the state, the water is

brackish and strongly tinted with tannic acid. This particular river begins some 40 to 45 miles from the coast and runs into Edisto River approximately 35 miles downstream from where we were diving.

The surrounding land is largely undeveloped and uninhabited. A variety of wildlife flourishes here in the lush marshes. It is common to see cranes, hawks, ducks, seagulls, kingfishers and an occasional vulture as they search for a meal along the river. If you really look, you will be able to find an alligator or two basking in the sun.

At one time huge rice plantations, with all the splendor of the antebellum South, graced the river banks. Many of the original levees and flood gates still remain, as well as a few of the more stately reminders of times long past—chimneys. They rise as lone centurions above the palmetto trees, large century plants and heavy undergrowth. Traveling the surface of this river is like being catapulted back into time 300 years. It is unbelievable.

I continued to descend. My depth gauge indicated I was passing the 12 foot mark, less than halfway to the 30 foot channel bottom. I tried to control my fear by telling myself that what I was doing at this moment was why I had learned to dive in the first place. My love of history and lifelong hobby of collecting artifacts had finally led me to the water. Now here I was, doing what I was driven to do and wishing the whole time I had never heard

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of scuba.

My descent ended rather abruptly as my fins touched the river bottom. I was immediately knocked off my feet by the current. I fell on my belly and grasped the bottom with my free hand to prevent myself from being carried any further downstream. Lying there, trying to compose myself, I found that I had fairly good visibility as long as I kept the dive light directly on the bottom. I could only see about a foot, but what I saw was beautiful.

There was no modern day debris, no beer cans or pop tops on the hard clay bottom. Here and there an occasional submerged tree or rock outcropping would slowly creep into my field of vision as I moved upstream. I could sense their presence before I could actually see them. A small crab scurried along the bottom in front of my facemask, startling me. It was followed by another. Slowly but surely the fear inside of me gave way to amazement and a sense of anticipation of mythical treasure took hold. Each rock, each stick would take on a strange and magical shape. The silt raised by the outgoing tide, plus the tannic acid colored water made exact shapes hard to determine and made fantasy easier, adding to the excitement.

I had lost contact with my dive buddy although I knew he was very close. Prior to this last descent, we had agreed upon both an audible underwater signal and a procedure to follow should either one of us require emergency assistance.

Coming to a submerged log, I decided to search the upstream side of it. There it was! My first bit of treasure, a 4 x 6 inch fragment of Indian pottery. The shape was just so distinctly different from anything around it I couldn't miss it. As I picked it up, another odd shape rolled into view. It was a clay pipe stem! Both went into my goodie bag. I was getting hooked on river diving.

I continued on. In a small depression there were several broken bottles. All were very old. Right in the middle of this I found two more pieces of Indian pottery. Now pottery fragments may not sound like much to some folks, but these turned out to be over 2000 years old.

By this time all the fear was gone. In fact I felt rather foolish for panicking so quickly. It was time to surface and change tanks.

The second dive was much different from the first. For one thing the tide was now all the way out and we had virtually dead water. Instead of dropping directly down into the channel as before, I decided to follow the bottom out from shore to see what relics might be found in shallower water.

Although I found no artifacts, I did find that the bottom, (sand instead of clay) sloped rather gradually toward the channel to a depth of about eight feet, at which point the bottom stopped. There was nothing there but a sheer drop-off and im-

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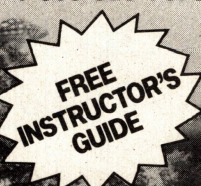
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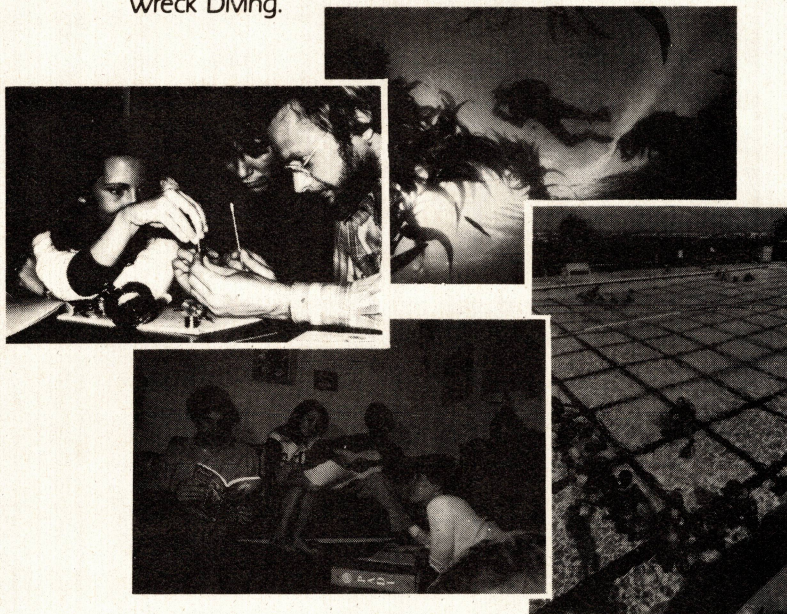
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RIVER DIVING

penetrable darkness. Taking a deep breath, I plunged over the ledge.

I hit the floor of the channel with my outstretched hand long before it came into view. It was an eerie feeling in that although it appeared I was in open water, I could feel the presence of the channel wall close beside me, enveloping me like a blanket. The wall was much like a small cavern. The flow of water had undercut it some two or three feet.

Visibility was somewhat diminished from the last dive because the silt raised by the tide was now suspended rather than flowing. The bottom composition was softer than the previous area. I prodded a small eel out of his niche in the wall. There were not as many rocks lying about as before. I was alone again with my thoughts and felt very safe.

As I became more complacent and had begun to think that I was the best river diver there ever was, I felt a hard thump on my back. Knowing it was my dive buddy, I turned around to see what he wanted. He wasn't there. Thinking that maybe he had pulled back a foot or so and lost contact, I shined my dive light in that direction. I still couldn't see anything. I decided I was beginning to imagine things and went back to my reaching. Almost immediately I was hit again, only this time harder. Before I could turn around I was hit two more times. It was like someone was hitting me with their closed fist. By now I had myself believing I was being attacked by a killer alligator or some other such formidable creature. It was time to surface—which I did with great vigor!

Actually, what had probably happened was that I had been mistaken for suitable mating material by some carp, but it took some time to convince myself of this.

Descending again, I came upon a large rock and glided over it. Sitting near the rock, with absolutely nothing around it, was an object that appeared to be a conch shell. Something about it didn't look natural. I picked it up. It was obviously a shell, but manmade. I put it in my goodie bag for examination later and continued on.

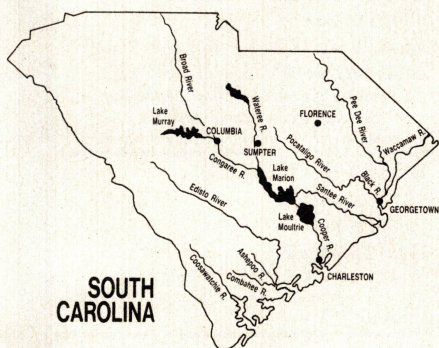
I found some more Indian pottery and broken bottles. I was starting to wish that I could stay here forever but alas, I was out of air again.

I surfaced and reunited with my partner to compare notes. We had done well for the day. My shell turned out to be china. It was white and had been decorated with blue designs. I imagine it at one time graced the side of a punch bowl sometime in the late 1700's. My partner had managed to find a blue and white china soup bowl that we later learned dated

from 1675 and was valued at over \$30. He had also found two cypress bottles from the 18th century as his/her own. Anyone planning to dive in the Carolina river, depending on the river, should check tide tables before diving.

Depth can range from several feet to 10 inches. If the lack of it is a concern, consider diving during the winter months when the water is usually clearer. There is not as much silt or suspended algae growth then.

It will also be necessary for the diver to obtain a license from the State of South Carolina before searching for or recovering any artifacts or fossils from State controlled waters, which include all the rivers. It is a very simple procedure. Information is available from the Institute of



Archaeology and Anthropology, University of South Carolina, Columbia, South Carolina 29208.

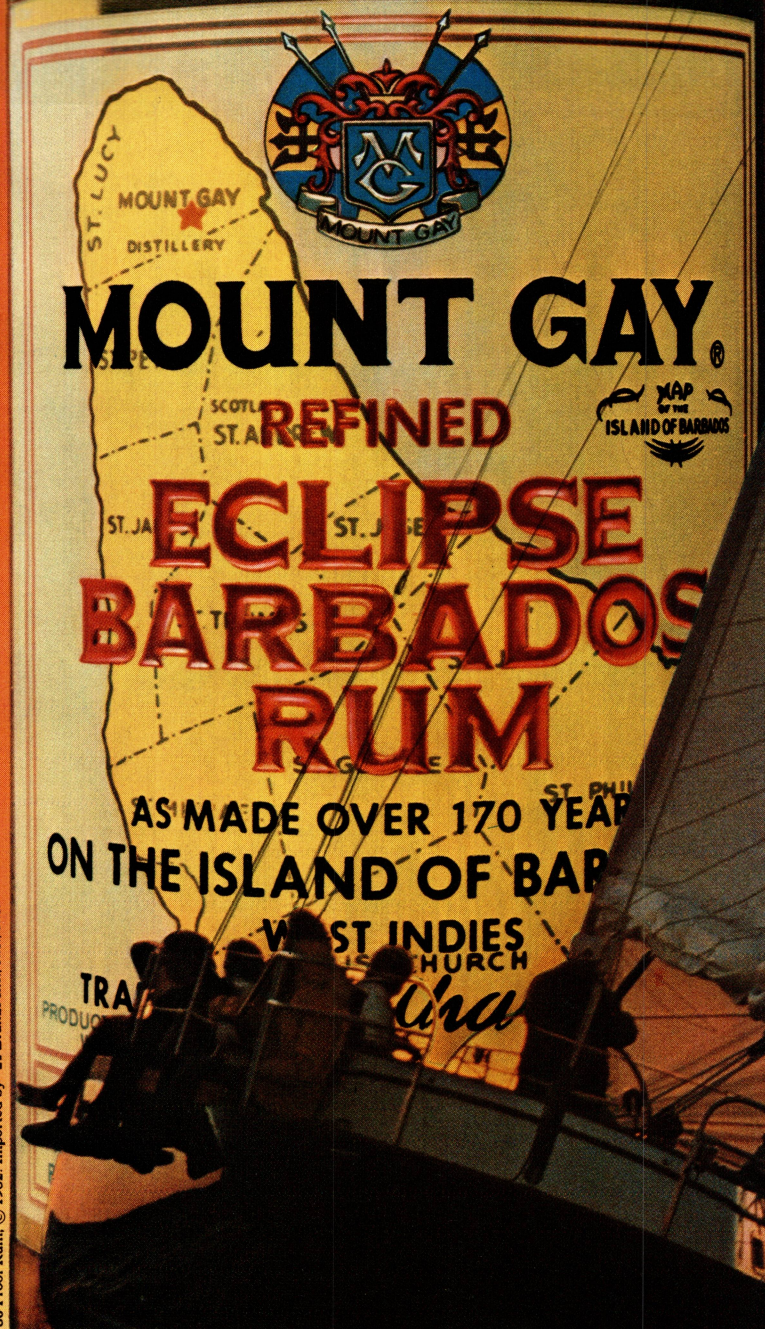
One word of caution. It is extremely easy to become tangled in submerged trees, brushpiles, or cypress roots because of the lack of visibility. This can usually be avoided by watching what you are doing and taking it slow and easy on the bottom.

Since this first dive, my partner and I have returned to this site many times. Each time the action of the current has renewed the site with artifacts from bygone eras. We have never left empty handed. In fact, besides the bottles and other relics recovered, we have found fossils dating back 24 million years. No matter how many times we dive this site, the excitement and anticipation of that first dive always returns. We have spent many an hour over a cold beer reliving each find and laughing at ourselves over our experiences. South Carolina river diving is that kind of sport.

Virtually all of the rivers in the eastern part of the state offer this kind of excitement. Relics recovered will span thousands of years of history. To locate

(Continued on Page 85)

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What's four inches long and lights up your world?

TEKNA'S T-1050 MICRO-LITE

TEXT AND PHOTOGRAPHY BY BONNIE J. CARDONE



The Micro-Lite is powered by two tiny N cell batteries, each of which is just over one inch in length. The light itself is four inches long. Off the light the one inch diameter lens cap can also be used as a magnifying glass.

The typical reaction to the Micro-Lite is: "Isn't that cute!" It looks like a toy: It's just four inches long and the lens is only an inch in diameter. The power source is two N cell batteries, each about one and one-eighth inches long. But, surprise, the Micro-Lite is a working dive light not just a miniature imitation.

The Micro-Lite looks like one of the regular sized Tekna lights that somehow shrunk. It has a black ABS resin body with red lettering. According to the manufacturer, this thermoplastic is so tough it will stop a .22 calibre bullet. Sealed by a single O-ring at the base of the threads for the lens cap, Tekna lights are said to be completely waterproof to 2000 feet. The manufacturer also says they are explosion proof in volatile atmospheres.

The Micro-Lite has a polycarbonate lens cap with a built-in plano-convex lens. It magnifies 2.5 times and when removed from the light can be used to read fine print, the details on a map or, under the proper conditions, to concentrate sunlight to start a fire. (Talk about a survival light!) The lens focuses the light into a tight beam for a spotlight effect. This is more for use topside than underwater.

Until now, you've probably never heard of N cell batteries. These are disposable alkalines, most often used in handheld calculators and some photographic equipment. N cells are sold in hardware stores and photographic supply departments. If you have trouble finding them, visit your local Sears, K Mart or Radio Shack. Either Mallory's MN9100 or Eveready's E90 can be used in the Micro-Lite. Each cell is 1.5 volts. Two of them provide the Micro-Lite with more than one and one-half hours of continuous light and sell for less than \$1.75. (Our test light burned for two hours.)

It's so cute you don't expect the Micro-Lite to function well, but it does. It has a surprisingly bright beam (1600 candlepower, according to Tekna). You can use it as a backup or emergency dive light or as a topside light for your keychain. Since it's waterproof you don't have to worry about using it in inclement weather.

The Micro-Lite weighs just one and three-quarters ounces with batteries and is negative underwater. It uses a standard GE 222 incandescent bulb, which provides about five hours of burn time and is available wherever bulbs are sold. The reflector is highly polished and parabolic in shape.

Care of the Micro-Lite is easy. Rinse it in fresh water after a dive and let dry. Clean the O-ring groove with a cotton swab and clean and grease the O-ring frequently. (Use only silicone grease.) Tekna advises avoiding hydrocarbons such as gasoline, oil, petroleum grease, alcohol, etc., because these may cause the housing to craze or crack. If you decide to wash your Micro-Lite, use only a mild detergent.

Almost everyone floods his/her first Tekna light. This is because the light turns off and on with a one-half turn of the lens cap. The problem is that divers figure if one-half turn is good, one or more turns is even better. This often results in water leakage. If this should happen, simply rinse all of the parts in fresh water and dry. Replace the batteries and the light will work like new. (If the light has sat with saltwater in it you may have to scrape corrosion off the metal parts.)

The Micro-Lite sells for \$6.95 (without batteries). For more information on it and other Tekna products contact: Tekna, P.O. Box 2363, Menlo Park, CA 94025.

MARK IX

SDM SPECIAL SERIES ON REGULATORS

SCUBAPRO MARK IX

TEXT AND
PHOTOGRAPHY
BY GEORGE COZENS

There's a mystique about top-of-the-line (t-o-t-l) regulators. Perhaps it is owing to slick advertising and salesmanship, or to the pursuit of the Great American Dream: "Be the first on your block to own a new, personal luxury, top-of-the-line regulator." Maybe it's owing to a common misconception that bigger and more expensive is better. Or, to the idea held by some divers, instructors and even sales personnel that, "You can't go wrong with a top-of-the-line regulator." Whatever the reason, it is unfortunate that the t-o-t-l label should have such a high priority with so many shoppers. Regulators, like people, should be judged as individuals, on their own merits.

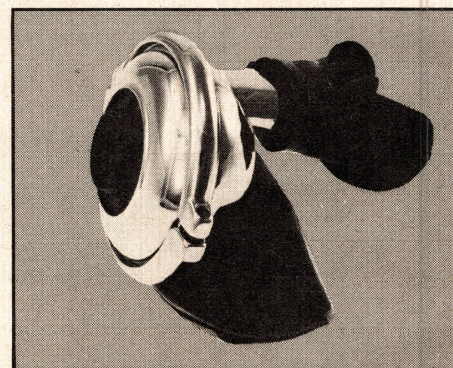
A case in point is a new addition to the Scubapro regulator line for 1983. This newcomer is the Mark IX first stage which, when mated with the existing High Performance second stage, forms an ideal marriage. Consistent with Scubapro's nomenclature, the newlyweds have no joint name, but they do share a common catalog number—12-400-000. The Mark IX first stage/High Performance second stage combination is not Scubapro's top-of-the-line regulator—in fact, it's not in second or even third place. Indeed, this regulator ranks about sixth place, in

terms of price. But don't let this position mislead you—read on before you make any decisions. Scubapro prefers to call it a mid-line regulator, a title by which the company means "quality and performance at an economical price." If the terms economy and mid-line model conjure up connotations of cheap materials and shoddy workmanship, they couldn't be further from the truth in this case.

With so many regulators in the marketplace, why might a mid-line unit deserve your attention? Simple! This regulator just might be better than some other t-o-t-l models you've seen around.

Appearing for the first time this year, the Mark IX first stage incorporates a balanced, flow-through piston design that dates back to 1966, when Scubapro introduced the Mark V first stage. It became Scubapro's most popular first stage model, has become one of the most widely imitated first stages in the dive industry and formed the basis for a series of Scubapro first stages to follow, the most recent of which is the Mark IX.

In outward appearance, the Mark IX looks very much like its predecessor, the Mark VIII. It has: a chrome plated, brass body and non-swivel, low pressure cap; a chrome plated, forged brass, swivel



yoke, rated at 3300 psig; a stainless steel piston and spring; and a solid Teflon, high pressure valve seat. The Mark IX also features: two larger size (7/16 inch, for safety) high pressure ports, identified with the initials HP and positioned on opposite sides of the body; five low pressure ports, one on the very end and the rest evenly spaced around the perimeter of the low pressure cap; the Silicone Protected Environmental Cap, designed to keep silicone grease in the area of the spring and piston to reduce or eliminate freezing there; and an intermediate pressure range of between 128-140 psig.

These features are nothing new. The significant changes which set the Mark IX apart from other Scubapro first stages were made internally, in the critical parts of the regulator system: the piston and spring. The stainless steel piston was redesigned to be smaller and lighter weight, resulting in a more compatible mating with the spring. These subtle modifications changed the working range of the spring, allowing it to function better at lower supply pressures (say, below 500 psi). This means at these lower pressures, when inhalation resistance normally increases on typical regulators, the improved piston/spring combination of the Mark IX permits the piston to open further, for greater air flow and, hence, better performance.

When the supply pressure is low, seemingly minor things can affect the regulator's performance. Take, for instance, the sintered filter in the high pressure inlet: Generally, the smaller the surface area of the filter, or the more clogged it is with corrosion, the greater will be its resistance to air flow—this is true for any pressure, but is more pronounced at lower pressures. To offset this problem, the Mark IX has a conically shaped filter, which provides three times

friction and resistance to piston movement, reduced wear on the O-rings and the added benefits of a smaller, stronger, lighter weight first stage with more reliability and less maintenance.

All of these changes must have had some effect. In Scubapro's own tests, the Mark IX first stage out performed the Mark V at the low pressure end, delivering over one and one-half times the flow of intermediate pressure air (73 cubic feet per minute for the IX, 48 for the V), at a supply pressure of 300 psig.

A change to the new, more efficient, Super Flow Hose was an additional effort to increase performance. This intermediate pressure hose, now included on all Scubapro second stages, fits standard low pressure ports, but has a one-third greater air flow capability than conventional hoses.

Complementing the Mark IX is the High Performance second stage, first introduced in 1981 with the Mark VIII. It is a simple, conventional, venturi-assisted, downstream demand valve design. The rugged housing, including the back, cover and clamping ring, is of chrome plated brass. The exhaust tee, mouthpiece, diaphragm cover and demand valve seat are all made of neoprene rubber (but not

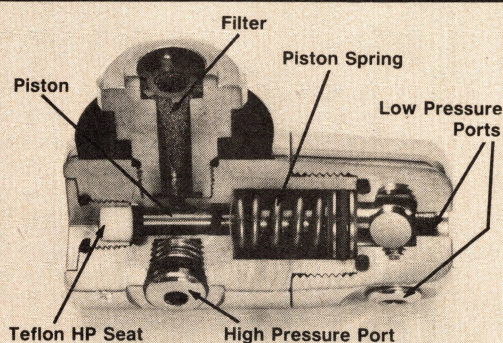
over the range of intermediate pressure from 115 to 160 psig; and an average flow rating of 25 cubic feet per minute.

Maintenance, as you might guess with such a simple design and corrosion resistant materials, is very minimal: rinsing in fresh water after use and drying out of direct sunlight. Scubapro requires annual service from an authorized dealer, or the factory, to keep the limited lifetime warranty in effect. Scubapro will replace any part necessary for no charge for the part if it is covered by the lifetime warranty. Most parts are covered, but the mouthpiece and the hose are covered under a separate limited, one year warranty and the filter is not covered under any warranty. Thus service costs on the regulator should be relatively nominal, depending primarily on the labor charges involved.

My initial evaluation of this regulator took place on a sandy bottom in about 30 feet of water, off Santa Catalina Island. Putting it through the paces was a pleasure. It performed quite well and compared very favorably with my regulator. Inhalation and exhalation resistances were relatively small, and did not vary significantly when breathing in different positions, at least no more than would be expected from a single hose regulator. Some exhaust bubbles ascended in front of the mask, but these disappeared when I tilted my head down a few degrees. The unit would not freeflow when held still and flooded with water, regardless of second stage orientation, but would sputter with enthusiasm if the case were full of air and the mouthpiece turned more than a few degrees above horizontal. Surprisingly, it did not freeflow when the second stage (with the mouthpiece kept horizontally) was pulled from my mouth while I was still inhaling from it. On the second dive I descended to about 100 feet, to see if I could out breathe the regulator—I couldn't, even to the point of hyperventilating myself. During the ascent from this deep dive, I stopped at about 10 feet, in an effort to check the performance at a very low supply pressure. I noticed little or no change down to an indicated tank pressure of about 100 psig. This regulator really does appear to meet Scubapro's claims.

Judging from the materials and the conventional designs used in both the first and second stages, this regulator should be dependable and easy to maintain, having the ability to withstand a lot of use and abuse without losing its performance. And its performance seems to be quite high, even down to very low tank pressures. If the combination of dependability, high performance and price (suggested retail is \$215) suit you, then look into Scubapro's Mark IX/High Performance regulator, it has a lot to offer. 

The Mark IX first stage (left) is combined with Scubapro's High Performance second stage (opposite). Below: Cutaway of first stage.



the filtering capacity of flat filters.

Additionally, all of the moving components were put in the Mark IX's body. In other first stages based on the Mark V design, the stem of the piston is held in the body, while the head of the piston sits inside the low pressure cap. This cap is a separate component which screws onto the body and if not accurately aligned (difficult to achieve with only a threaded attachment), can cause a slight binding in the piston movement. With the piston and spring contained wholly within the Mark IX's body, this alignment can be made much more precisely. This results in less

all from the same compound), while silicone is used in the diaphragm and exhaust valve. For reduced friction and wear, the stainless steel demand lever is plastic tipped where it contacts the stainless steel disc bonded to the back of the diaphragm. Features of this second stage include: a relatively large, slightly protruding purge button, which allows for easy access; a completely redesigned, doubly adjustable demand valve—both the demand lever spring tension and the orifice can be adjusted to give any cracking effort (initial inhalation resistance) from about 1.1 to 1.8 inches of water,

THE INFLATABLES



Over the past 25 years, Boston Whaler of Rockland, Massachusetts has developed a reputation for building rugged, seaworthy boats. These sturdy fiberglass crafts, with an unusual cathedral hull design have become accepted by sportsmen, commercial fishermen, marine safety agencies, scientists, and nearly everyone who works or plays in coastal waters. Over 120,000 of them have been built, ranging in size from nine foot skiffs to 25 foot cabin cruisers with such intimidating names as Outrage and Revenge. They all share a common foam filled fiberglass sandwich construction which makes them virtually unsinkable.

Five years ago, the company's decision makers correctly saw the growth of the inflatable boat market in the United States and decided to offer a line of inflatables carrying the Boston Whaler name. Zodiac was contracted as a consultant. Together with Whaler engineers, the French company designed the first boats, which were built in the European factory along with Zodiac's own economy priced line of Zed boats. There was quite a family resemblance. Whaler concentrated on smaller boats, ranging in length from a nine foot dinghy to an eleven foot sportboat. All of the boats were coated with a PVC material.

Last year the Zodiac connection ended and all Whaler inflatables were extensively redesigned. A Japanese rubber company was contracted to build the boats in that country. Instead of PVC, the fabric is now coated with the more conventional neoprene/Hypalon mixture. A larger sportboat has been added to the lineup: The BWS 13. This is the first Boston Whaler inflatable large enough to fit the needs of divers, and is the object of our attention this month.

Unlike the fiberglass Whalers, the inflatable boats look quite conventional. The BWS 13 is 12 feet, 6 inches long with a beam of five and a half feet. Its color is an off-white with reddish brown trim. The fabric begins with a core of Vinylin, a base cloth said to be significantly stronger than the usual nylon fabrics. A membrane of neoprene and Hypalon is bonded to it. Whaler's mixture contains 80 percent Hypalon, one of the highest percentages in the industry. As a result, these boats should be extremely resistant to cracking and color changes owing to ultraviolet and ozone exposure.

The pointed nose of the BWS 13 is

BOSTON WHALER

covered by a fixed bowdodger, which can accept an optional windscreen. Underneath the bowdodger is a dry storage area protected by a drop curtain held in place by bungee cords and toggles. A pocket is included inside. The price of storage space is less room for people. The Whaler's bowdodger takes up nearly a third of the available interior space. Although the factory rates the boat for seven passengers, five would be a more realistic estimate.

Three separate chambers and an inflatable keel are filled through recessed valves, covered by Velcro sealed flaps. Valve bodies are plastic and, should one fail, it can be replaced in the field. They are held in place by stainless steel screws and can be changed easily.

Any owner will tell you that the most frustrating part of assembling an inflatable boat is fitting the floorboards into the grooves of the stringers. It is a ritual always accompanied by much sweating and cursing. Not so with the Whaler. The stringers have no groove and just lie on top of the floorboards serving as space fillers. When the boat's pontoons are fully inflated, the stringers and floorboards are wedged in tightly, lending stability and ri-

gidity to the entire floor assembly.

The boards are made of marine plywood and are covered by a urethane coating. Floorboards require the most attention in an inflatable and this one is no exception. Although Whaler does not offer carpeting as an option, an owner ought to get some indoor-outdoor carpet and cut it to fit before the first tank or weightbelt gets a chance to scratch the coating. Annual sanding and refinishing of all wood parts should be a standard maintenance procedure.

In the old days, the only way to fill an inflatable was with a foot pump. Today, several manufacturers have switched over to hand pumps, and Boston Whaler is one of them. The all plastic pump has several unique features. It pushes air on both the upstroke and the downstroke. A pressure gauge is built-in. When deflating, it can be reversed to suck out the last bit of air, making the boat easier to pack. And finally, it can be used as a bilge pump with an accessory hose added. A hand pump can be hard on a person's back. But once the correct technique is learned, it becomes easier. The trick is to lean forward and use the arms rather than the back to do the pumping.

Standard equipment on the BWS 13 includes a lift handle, towing rings, and a transom mounted bailer plug with a nonreturn valve. Four rubber handles on the sides are comfortable to grip and don't dig into your hands when carrying the boat. A large canvas carrying bag is supplied, which accepts both boat and floorboards. The resulting package is bulky, concentrating 151 pounds into one heavy load. This is, no doubt, an economy measure.

For our test, we picked up the BWS 13 at Dive 'n Surf, Redondo Beach, California. Besides being one of the nation's first dive stores, the Meistrells' facility is also one of the West Coast's major Boston Whaler dealers.

The test drive took place during the period of heavy storms which battered the Southern California coast last winter. As we approached the King Harbor breakwater, surf was breaking over the top of the jetty. A red Small Craft Advisory flag was flying from the harbor master's yardarm. At the harbor mouth, we apprehensively looked up at the waves generated by a combination of big swells and wind chop. Since financial arrangements with SKIN DIVER don't include hazardous duty pay, a quick consultation was held. The consensus was that you don't fool with Mother Ocean when she is angry. Therefore the test, such as it was, had to be conducted inside the harbor.

A couple of short sprints demonstrated that a 25 horsepower engine could instantly plane three persons with dive gear. Dive 'n Surf's Bob Badali assured me that a 15 horsepower motor would also do the job. In terms of handling, he says that the boat takes turns with a slight bit of sideslip typical of boats with inflatable keels. Owing to the long bowdodger, it was a tight fit with four persons sitting on the pontoons and the floor covered with dive gear. Actually, a lot of it could be stored underneath, but we left it out for photographic purposes.

Boston Whaler has concentrated its efforts on smaller inflatable boats: The BWS 13 is the flagship of the fleet. Inflated, it is easily transportable on a car or small van. It will carry up to three divers on short jaunts along the coastline, or it can be towed behind a larger boat. Backed by a three year warranty and by Boston Whaler's nationwide dealer organization, the BWS 13 sells for \$1,560.

The BWS 13 is made of neoprene/Hypalon (80 percent Hypalon) bonded to a core of Vinylin. The fixed bowdodger can accommodate a windscreen. Underneath the bowdodger is a storage area protected from spray by a drop curtain.

BOSTON WHALER BWS 13

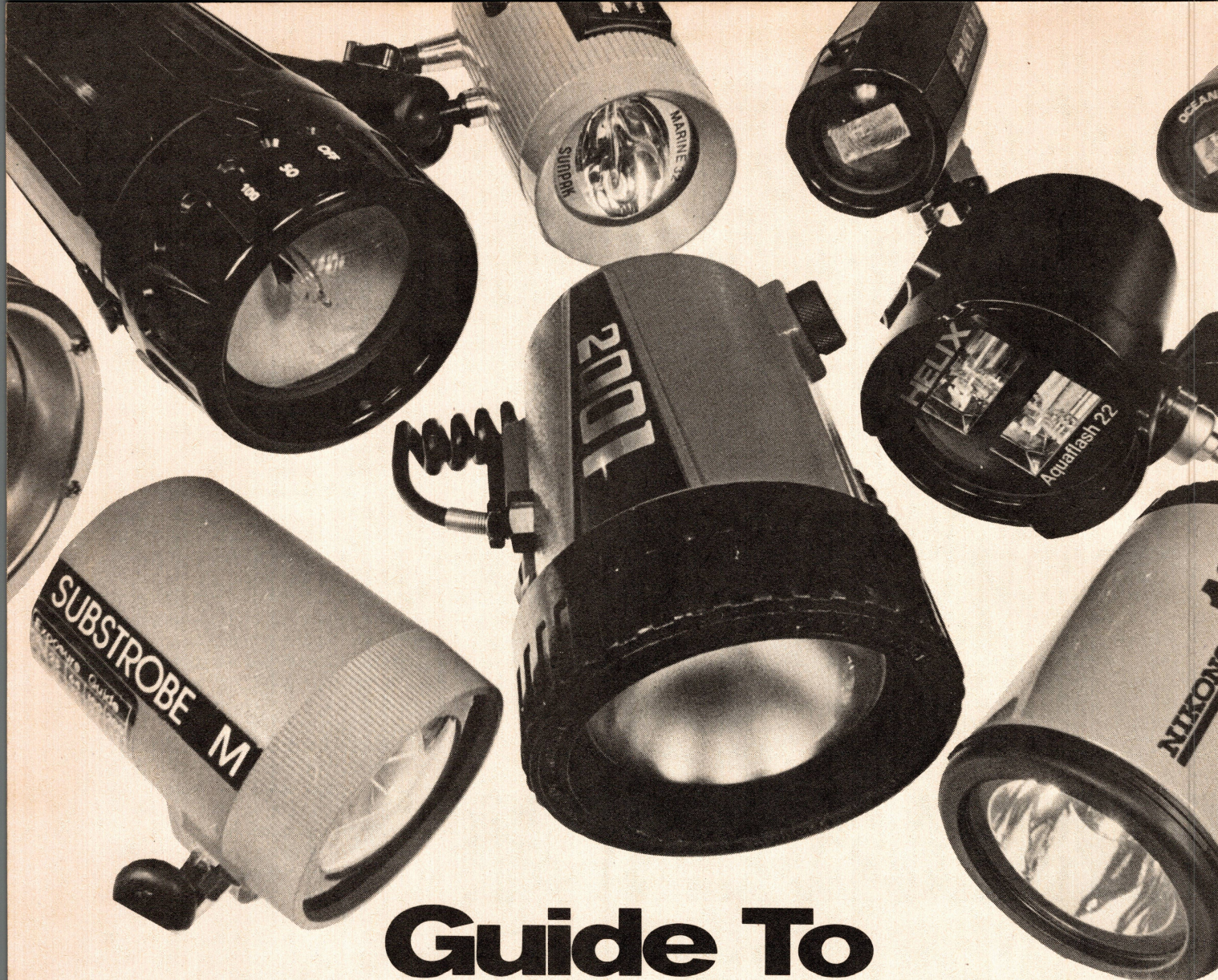
Overall length.....	12' 6"
Overall width	5' 6"
Interior length.....	8' 2"
Interior width.....	2' 6"
Pontoon diameter.....	17"
Material	Vinylin/neoprene/Hypalon
Floorboards.....	wood
Number of chambers.....	3 + keel
Weight.....	151 lbs.
Payload.....	1802 lbs.
Capacity.....	5 or 3 divers
Maximum horsepower	25
Color	Off-white, brown trim
List price.....	\$1,560



BWS 13

For transportability & dry storage

TEXT AND PHOTOGRAPHY BY ERIC HANAUER



Guide To U/W STROBES

Buying a strobe can be a frustrating task if you are new to U/W photography. Why? Because there isn't a single strobe that is best for everyone. Each has characteristics and features that may be advantages or disadvantages to you, depending on your needs. The purpose of this article is to help you understand how strobes differ and to choose the strobe that is best for you.

REPAIR SERVICE AND WARRANTY

"Where do I take it if it breaks?" is the first question we ask about any new strobe. Other important questions include the address of the nearest service center, the normal turn-around time on repairs, and exactly what is covered in the warranty. Regardless of what the salesperson may say, any strobe can break

HOW THEY DIFFER- WHAT'S BEST FOR YOU

TEXT AND PHOTOGRAPHY
BY JIM AND CATHY CHURCH

down, and if it does, convenience of repair will be a major consideration. Although the repair records of different companies vary from month-to-month and year-to-year, Ikelite has one of the best reputations for consistent, quick service. If you are buying a used strobe, several years old, repairs can be a problem for any manufacturer because parts may not be available.

SIZE & WEIGHT

Consider the size and weight of the entire system including the camera and all

necessary arms and brackets in addition to the strobe. A strobe arm that is just a few inches too long to fit your carrying case can be an annoying problem. If you need tools to assemble the system, add the weight of the tools to that of the camera/strobe system.

SLAVE SENSORS

Some strobes have a built-in slave sensor. This triggers the strobe when it detects the flash of light from another strobe. There are two basic kinds of slaves: sync and cordless. A sync/slave has both a connector cord leading to the camera and a built-in sensor. A three-position off/sync/slave switch is used to turn the strobe to either the sync or slave mode, so it can be triggered either by the camera or another strobe. When some strobes are set for the slave mode, they

can be triggered either by the flash of another strobe, or by the camera through the sync cord. A cordless slave simply is one with no connector cord. It can only be used as a slave.

For best results, we believe that the slave sensor should be near the front of the strobe where it will be exposed to the light from the master strobe. Sensors mounted on the side of the strobe may not react to light reflecting from the subject and sensors mounted on the top can be overpowered by the bright surface.

AUTOMATIC EXPOSURE CONTROL

An automatic exposure control has a remote sensor (different from a slave sensor) mounted near the camera lens. Depending on the film speed selected, you preset the lens according to the instructions for the automatic control used. When the strobe flashes, light reflects back from the subject to the remote sensor. And when the sensor "sees" that enough light has been reflected for a proper exposure, it shuts the strobe off. Thus, exposure is controlled by the duration of the flash.

The greater the number of apertures you can choose with an automatic exposure control, the more versatile it is. If you can begin with an exposure meter reading, then set the lens aperture and automatic control for the desired f stop to balance sunlight and strobe, the automatic becomes a tool rather than a crutch.

For standard lighting with most subjects, automatic exposure controls work. However, there are four limitations: (1) The sensor must "see" the subject. If the subject is too small and the sensor responds to the background the exposure will be wrong. (2) The preset aperture must not be too wide for the ambient light exposure. In bright conditions, set for a higher-numbered stop if necessary. (3) For creative techniques involving back and extreme side lighting, manual control is usually best. (4) The automatic control will have (either or both) a minimum and maximum camera-to-subject distance.

We prefer an automatic sensor that can be removed from the camera/strobe system if you decide to work with manual control. Otherwise, you have an extra piece of equipment cluttering the system.

The MCD-2 differs in that it has a non-detachable bulkhead fitting so the sync cord can plug into an auto sensor inside of a camera housing. This dedicated operation can be used with a variety of 35 mm SLR cameras. Write to Marine Camera Distributors for details concerning your particular camera.

BATTERY SYSTEM

The choices are: high voltage, dispos-

able batteries; low voltage, disposable alkaline cells; and rechargeable ni-cads. If you take extended trips to remote locations, where electrical outlets and batteries may not be available, the high voltage batteries are an excellent choice because they give hundreds of flashes before wearing out. As examples, the Subsea Mark 100 is powered by a 300 v battery, and the Subsea Mark 150 by a 510 v battery. Rechargeable ni-cad packs may be available from Subsea in the near future.

If you plan infrequent photo trips, and the strobe will be in storage most of the time, 1.5 v alkaline AA or C cells are a good choice. You can use an old set to condition the capacitor (by flashing the strobe several times and then leaving it idle in the on position for a half hour), and then insert a new set for the trip. Alkaline cells are available at many retail outlets. Note: for best results, get alkalines rather than carbon-zinc cells.

If you use your strobe weekly or even monthly, ni-cad cells (in place of alkaline cells) or built-in ni-cad battery packs may be a more economical choice. Although the ni-cads cost more, they can be recharged hundreds of times. Remember that ni-cads should be used frequently to keep them conditioned. Thus, for infrequent use, ni-cads may not be best.

POWER SETTINGS

Some strobes have power settings for high and low power. This feature is most valuable with high powered strobes that you may wish to turn down. For low and medium power strobes, power settings are less important.

NUMBER OF FLASHES

Reduce the manufacturer's claim for the number of flashes the strobe will get from a fresh battery by about 20 percent. The manufacturer assumes fresh batteries and a strobe that is in top condition and these conditions don't always apply to you. Think of the number of flashes as multiples of 36—the number of rolls of film you can expose before the battery is exhausted. The number of flashes is related to the power output and size of the battery. If the manufacturer has kept a powerful strobe as small as possible by reducing battery size, the strobe may exhaust batteries quickly at the higher power setting.

RECYCLE TIME

This is the amount of time the strobe needs to recharge the capacitor between flashes. With alkaline-powered strobes, the recycle time gets longer and longer as the batteries wear out. Thus, advertised recycle times assume new batteries. The recycle time for 300 v or 510 v high-voltage batteries increases with time

and use but not as severely as with the alkalines. The recycle time with ni-cads remains fairly constant during use and then lengthens abruptly when the ni-cads are exhausted.

POWER OUTPUT

The power output of a submersible strobe may be expressed in guide numbers, apertures or watt-seconds and can be a touchy area where opinions differ: (1) The manufacturer of a normal-beam strobe may proudly point out that his strobes have a higher guide number than his competitor's larger, more expensive wide-beam strobes. The manufacturer of a wide-beam strobe could agree that this is true, but argue that his wide-beam strobe must illuminate a much larger area. Also, he might say that the normal-beam strobe has a narrow beam with a hot spot in the center. (2) Some manufacturers appear to be competing on the basis of power. And, in our opinion, using too much power ruins too many pictures. With powerful normal-beam strobes, we usually set the strobes for the lower power settings. This gives us softer lighting and longer battery life.

How much power do you need? In our opinion, a normal-beam strobe that produces proper exposures at f5.6 or f8 at three apparent feet with ASA 64 color slide film will be adequate for most of your photography. And, for a wide-beam strobe, f5.6 is adequate. Using more power tends to darken the backgrounds and accent backscatter from suspended particles in the water.

BEAM ANGLE

This can be a critical decision. Normal-beam strobes are typically powered by AA or C cells (alkaline or ni-cad) and usually cover the diagonal 46 degree U/W picture angle of a housed 35 mm SLR with a 35 mm lens behind a flat port, or a Nikonos 35 mm lens with or without close-up lenses and extension tubes. With a 28 mm lens, the normal-beam strobe will probably only cover the central area of the larger 28 mm 59 degree picture angle. This may not appear as a problem because the corners of U/W pictures are often distant backgrounds you can't light anyway.

When your system expands to include a wide-angle lens, (such as a 24, 20 or 15 mm lens, or a wide-angle adapter), then the angle of the normal-beam strobe will be too narrow to cover the picture area. Yes, you can use sunlight exposures and use the strobe to spotlight selected subject areas, but you can't throw soft fill lighting over large subjects.

Wide-angle diffusers are available to widen the angles of some strobes. The MCD-1 and MCD-2 strobes can be fitted

SKIN DIVER GUIDE TO SUBMERSIBLE STROBES

Manufacturer or Distributor	Name or Model	Size (in.) & Weight	Battery System	Charge Time	Power Settings	Number of Flashes	Recycle Time (sec.)	ASA 64 Aperture	U/W Beam Angle	Color Temp.	Connector System	Includes Brackets	U.S. Price
AQUACRAFT 7992 Miramar Rd. San Diego, CA 92126	Novatek II & III	3.75 x 4.75 25 oz.	2 C	—	full	350 a	6	f5.6	60 d	dl	N, E	No	\$290.00
BERKEY MARKETING CO. 25-20 Brooklyn-Queens, Expressway Woodside, NY 11377	Sunpak Marine 32 (sync/slave)	4 x 7.2 3.6 lbs.	6 AA BNB	— 3	half full	75 n 150 a 50 n 100 a	7 a 4 n 5 a 2 n	f5.6-8 f8-11	35, 28 or 20 mm	5500 K	N	yes	\$466.00
GRAFLEX/SUBSEA 1006 West 15th Street Riviera Beach, FL 33404	Mark 30	3.25 x 6 2 lbs.	3 C	—	1	450 a	6.5	f8	35 mm	dl	N, E	no	\$289.50
	Mark 100	4.5 x 9 3.5 lbs.	300 v	—	50 ws 100 ws	1500 750	3 6	f4 f5.6	90 c	5500 K	N, E	no	\$485.00
	Mark 150 (sync/slave)	5.5 x 10 6.5 lbs.	510 v	—	50 ws 100 ws 150 ws	1500 750 500	2 4 6	f4 f5.6 f8	90-150 c	5500 K	N, E	no	\$596.00
COSINA AMERICA, INC. 3669 W. 240 St. Torrance, CA 90505	Seamaster ST	3.6 X 5.5 1.5 lbs.	4 AA	—	full	160 a 80 n	7 5	f5.6-8	45 x 70	dl	N	no	\$269.90
HELIK 325 W. Huron St. Chicago, IL 60610	Aquaflash 22 (1 auto stop/manual/ sync/slave)	4 x 6 3.3 lbs.	6 AA	—	1/4 full	— 110 a	2 7	f3.5 f8	53 x 70	5500 K	I, N, E	yes	\$399.50
IKELITE P.O. Box 88100 Indianapolis, IN 46208 (Flash Monitor 3-stop auto can be used with Substrobes)	Substrobe M	3 x 4.5 1.5 lbs.	4 AA	—	full	200 a 150 n	3 2	f5.6	50 x 70	dl	I, N, E, S	no	\$170.00
	Substrobe MS (cordless slave)	3 x 4.5 1.5 lbs.	4 AA	—	full	200 a 150 n	3 2	f5.6	50 x 70	dl	—	no	\$170.00
	Substrobe 75 (sync/slave)	5.25 x 10.25 7.5 lbs.	BNB	4	2	300-40 ws 150-75 ws	1.5 3	f4 f5.6	110 c	5800 K	I, N, E, S	no	\$349.95
	Substrobe 150 (sync/slave)	5.25 x 10.25 7.7 lbs.	BNB	3 QC 15 reg.	3	600-40 ws 300-75 ws 150-150 ws	1.5 3 6	f4 f5.6 f8	110 c	5800 K	I, N, E, S	no	\$495.00
MARINE CAMERA DISTRIBUTORS Studio B, 5121 Santa Fe, San Diego, CA 92109	MCD-1	2.5 X 6 1.2 lbs.	2 C	—	full	225 a 150 n	6-10 a 5-6 h	f11	58, 68 & 90	5850K	I, N, E, S	no	\$289.50
	MCD-2 (Ded. auto for housed SLR's)	2.5 x 6 1.2 lbs.	2 C	—	auto	225 a 150 n	to 10 a to 6 h	—	58, 68 & 90	5850K	I, N, E, S	no	\$425.00
MORRIS PHOTO SUPPLY 6435 N. Proesel Ave. Lincoln Wood, IL 60645	Aqua F-1 (1 auto stop-manual/ sync/slave)	4 x 6 3.3 lbs.	6 AA	—	1/4 full	— 110 a	2 7	f3.5 f8	53 x 70	5500 K	I, N, E	yes	\$299.00
NIKON, INC. 623 Stewart Ave. Garden City, NY 11530	SB-101 (2 auto stops/manual)	3.75 X 6 5.6 lbs.	8 AA	—	1/4 full	300 a 150 a	4 8	f5.6-8 f11-16	35 or 28 mm	dl	N	yes	\$469.00
OCEANIC, USA 14275 Catalina St. San Leandro, CA 94577	OS-2000	3.75 X 4.5 25 oz.	2 C	—	full	350 a	6	f5.6	35 mm	dl	I, N, E	no	\$230.00
	OS-2000S (cordless slave)	3.75 x 4.5 18 oz.	2 C	—	full	350 a	6	f5.6	35 mm	dl	—	no	\$250.00
	OS-2001	5 x 8.5 5 lbs.	BNB	4	full	300+	7	f8	95 c	5800 K	I, N, E	no	\$525.00
	OS-2001S (sync/slave)	5 x 8.5 5 lbs.	BNB	4	full	300+	7	f8	95 c	5800 K	I, N, E	no	\$560.00
	OS-2002 (3 auto stops/manual)	5 x 8.5 5 lbs.	BNB	4	full	300+	7	f8	95 c	5800 K	I, N, E	no	\$699.50
	OS-2003	5 x 8.5 5 lbs.	BNB	4	low high	350+ 300+	4 6.5	f5.6 f8	90 c	5800 K	I, N, E	no	\$599.50
	OS-3002 (3 auto stops/manual)	5 x 7 6 lbs.	BNB	10-12	low high	300+ 350	1 2	nt	105 c	5800 K	I, N, E	no	\$750.00
	OS-3003 (sync/slave)	5 x 7 6 lbs.	BNB	10-12	low high	300+ 350+	1 2	nt	105 c	5800 K	I, N, E	no	\$650.00
RICOH OF AMERICA, INC 20 Gloria Lane Fairfield, NJ 07006	Ricoh Marine Flash	3.8 x 4.6 2.5 lbs.	4 AA	—	1	180	6	f5.6	60d	dl	R	yes	\$259.00
SEA & SEA 1334 S.E. 17th St. Ft. Lauderdale, FL 33316	Yellow-Sub 20 (sync/slave for 110)	2.5 x 3 1 lb.	2 AA	—	1	250 a 130 n	6 3	nt	28 mm	5000 K	N, S	yes	\$190.00
	Yellow-Sub 50M (sync/slave)	4 x 6 2.2 lbs.	4 AA	—	1	250 a 130 n	5 3.5	f5.6-8	28 mm	5400 K	N, S	no	\$216.00
	Yellow-Sub 50A (4 auto stops/manual)	4 x 6 2.2 lbs.	4 AA	—	1	250 a 130 n	5 4	f5.6-8	28 mm	5400 K	N, S	no	\$430.00
	Yellow-Sub 150 (sync/slave)	5 x 9 4.75 lbs.	BNB	12	half full	200 100	2 4	f8 f5.6	100 c	5400 K	N, S	no	\$580.00
SONIC RESEARCH 8620 A Via Mallorca Dr. La Jolla, CA 92037	SR2000 (sync & slave)	2.3 X 5 15 oz.	BNB	15	1	250	2	f8	35 mm	dl	N, E, S	no	\$199.00
	SR3000 (sync & slave)	2.3 x 5 15 oz.	2 AA	—	1	180 a 100 n	8 a 4 n	f8	35 mm	dl	N, E, S	no	\$199.00

ABBREVIATIONS:

a —alkaline	C—C alkaline or ni-cad cell	dl—daylight	K—degrees Kelvin	nt—not tested	reg.—regular charge time	ws —watt-seconds
AA —AA alkaline or ni-cad cell	c—circular beam pattern	E—EO connector	N—Nikonos connector	QC—Ikelite quick charger	S —Nelson Sea-Loc connector	35 mm—covers 35 mm lens
BNB—built-in ni-cad battery	d—diagonal beam angle	I—Ikelite ICS connector	n—ni-cad	R—Ricoh connector	v —volt	28 mm—covers 28 mm lens

NOTES TO CHART:

Size and weight is for flash head only unless handle is permanently attached. ASA 64 apertures are for three apparent feet with strobe held at 45 degree angle to subject. Apertures are authors' estimates based on actual U/W testing, flashmeter testing, or by reducing air guide numbers to one-third to estimate an U/W guide number. Because of differences in the ages of strobes tested, manufacturing tolerances and testing procedures used, authors' estimates may differ from manufacturers' specifications. Prices may vary with connector choice, and all specifications may differ from past, present or future publications because of design changes.

with the Cokin Filter System to widen the 58 degree U/W beam angle to either 68 or 90 degrees, and color filters can also be used. The Nikon SW-101 wide-angle diffuser widens the beam of the SB-101 to cover the 28 mm lens. Colored or clear wide-angle diffusers can be placed, by the user, inside the YS50 manual or automatic strobes to widen the beams to cover a 20 mm lens. Two diffusers are available for the Sunpack Marine 32: The #24 wide-angle diffusion filter widens the beam to cover a 28 mm lens, and the #16 filter widens the beam to cover a 20 mm lens.

When considering wide-angle diffusers, remember that as you spread the light output of a strobe over a greater area, you reduce the intensity (guide number) of the light. If you widen the beam from 35 mm to 28 mm coverage, the intensity decreases by approximately one f stop; if you widen the beam to 90 degrees to cover a 20 mm lens, intensity decreases by approximately two f stops. And, if you use colored diffusers which filter out some light rays, you will lose additional intensity, depending on the strength of the filter.

Special wide-beam strobes usually have angles of about 90 degrees or more and are used with wide-angle lenses. Although larger and heavier than normal-beam strobes, these are usually the choice of U/W photographers using wide-angle lenses. For close-ups, however, we prefer the smaller strobes because it is easier to control a narrow beam for creative close-up lighting.

Should you buy a wide-beam strobe? Your decision depends on how wide a lens you plan to use. If you get serious about U/W photography, you may eventually buy a strobe for wide-angle photography and a strobe for close-ups.

COLOR TEMPERATURE

The color of strobe light is sometimes expressed in degrees Kelvin temperature. The higher the color temperature, the bluer the light; the lower the Kelvin temperature, the redder the light. In some cases, the manufacturer specifies the color temperature as being the color of average daylight. If so, we estimate the color temperature to be about 6000° K.

Kodak color slide films are balanced for a 5500° K light source. Thus, with strobes having a higher color temperature, such as 6000° K, slides may be slightly bluish in the whites and skin tones. You will probably notice more with close-ups taken with Ektachrome than with Kodachrome. If so, an 81A or 81B filter can be used to warm the picture.

Strobes with lower color temperatures,

such as 5500° K, produce warmer colors for close-up and medium distance portraits. But farther away, water absorbs red light rays and the strobe light gets progressively bluer as it travels from strobe to subject and bounces back from subject to camera.

CONNECTOR SYSTEM

If you intend to stay with a Nikonos, a sync cord with a Nikonos connector (any manufacturer's connector that plugs directly into a Nikonos) is probably the simplest, least expensive choice. However, a connector adapter, such as Nikonos to EO or Nikonos to Nelson Sea-Loc, does offer two advantages: First, you can plug the strobe sync cord into any model Nikonos with the appropriate connector adapter, or you can plug the sync cord into the bulkhead connector of a camera housing. Second, when the cord eventually breaks down or shorts out an inch or

Each strobe has characteristics that may be advantages or disadvantages

so below the Nikonos connector, you only replace the connector adapter. The entire strobe (assuming that you can't replace the cord) isn't out of action.

If you have an Ikelite system, the connectors for all the Ikelite strobes and housings are standardized. Thus, you can build upon your system.

For triggering two strobes with their sync cords (rather than by slave sensor), Ikelite has a T connector that can be used with an ICS (Ikelite Connector System) and the Ikelite ICS Console for the Nikonos IV-A has two ICS bulkhead connectors for attaching twin strobes as well as a Nikonos III/IV-A socket. Marine Camera Distributors can furnish a MCD-16 Y connector for Nikonos to Nelson Sea-Loc; and for a housed camera, the MCD-15 Y connector plugs into the MCD-17 Sea-Loc bulkhead. The twin Sea-Loc sync cords plug into these Y connectors.

ARMS & BRACKETS

The strobe will be held to the camera housing or amphibious camera with some type of arm and bracketing system. Sometimes this system is included in the price of the strobe; but in most cases the arms and brackets are separate.

When evaluating arm and bracketing systems, ask these questions: (1) Can

you easily attach and detach the strobe from the camera? (2) Does a flexible arm give you easy control over the strobe angle, especially if you are using a housed camera? (3) Does the arm seem to be designed for wide-angle or close-up work? You may find that you need two arms, one for wide-angle and another for close-up. (4) Is the finish and machining smooth? Check the fit of all threaded parts. Don't accept the product if the machining is rough.

SPECIAL FEATURES

The Helix Aquafash 22 has an automatic flashing beacon that can be turned on for an emergency signal—a good feature if you dive where you could be swept away by the current. An optional bracket is available for attaching small dive lights to the top of the flash. Helix offers a two-year warranty and is starting a loaner program at major dive areas.

The Ikelite Substrobe 75 and 150 have built-in modeling lights that can be used as dive lights for night photography and to aim the strobe in dim U/W light. The latest Ikelite strobes have removable sync cords, and an accessory Flash Monitor can be plugged in between the strobe and camera. The Flash Monitor has a built-in automatic exposure control sensor, slave sensor and ready light. Older Ikelite Substrobes can be modified to accept the new removable cords. Also, Ikelite has loaner programs at some major dive areas.

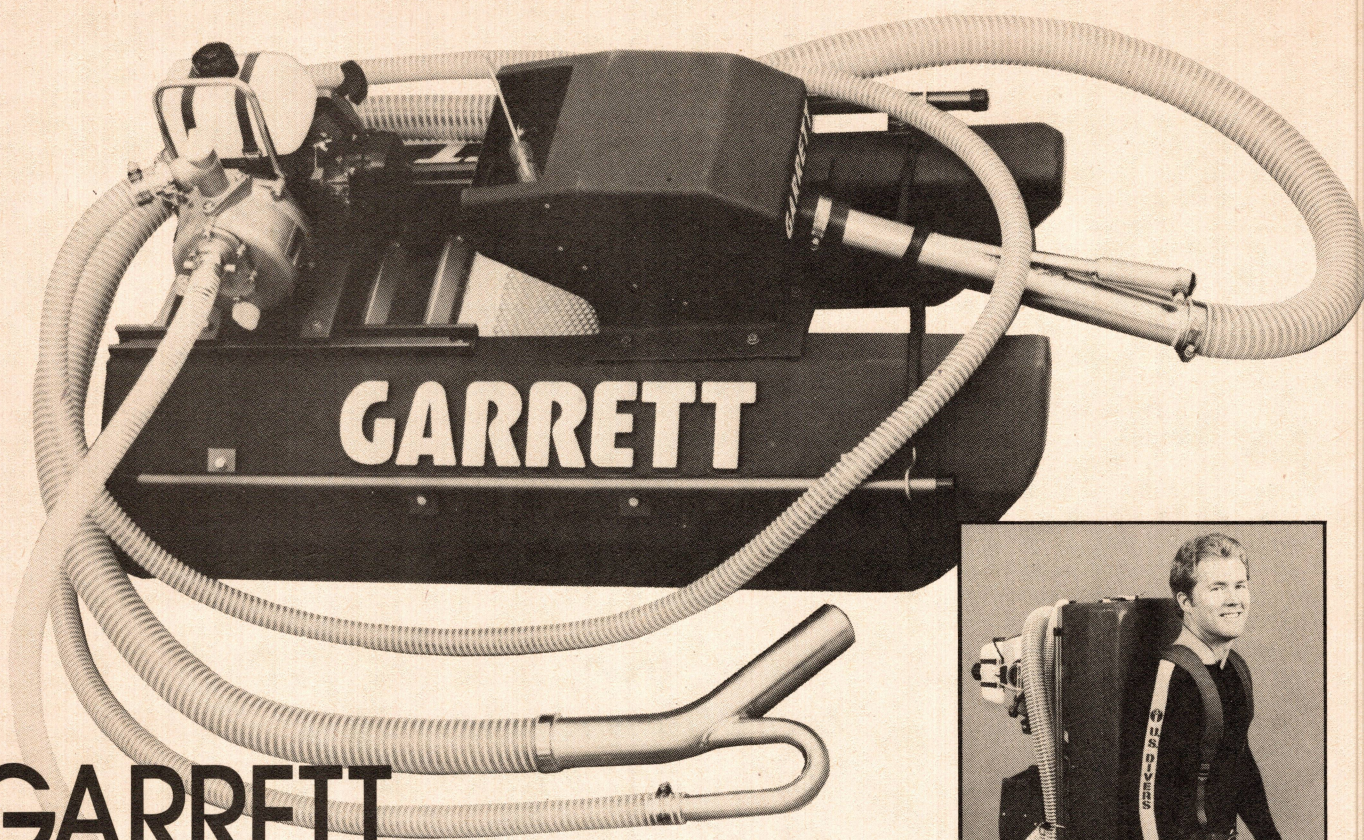
MCD strobes can be used with Cokin filters to change the color of the light for special effects. The user can change the sync cord, but soldering is required.

The Nikon SB-101 has a rubber ring around the front of the flash head to absorb impacts and a circular exposure calculator on the handle for automatic or manual exposure settings in air or underwater. The remote sensor for automatic exposure control can be removed when manual control is used.

Sonic Research SR2000 and SR3000 strobes have accessory threads for attaching filters in front of the reflectors.

The Subsea Mark 100 and 150 have special patented glass beaded reflectors that produce soft, diffuse lighting within the cone of light. The beam angle of the Mark 150 is user adjustable from 90 to 150 degrees. Both the main circuit board and sync cord of the Mark 150 are user replaceable with simple hand tools and the Mark 100 also has the user replaceable sync cord.

The Sunpack Marine 32 has a flood alarm light that turns on if the strobe leaks, and the flash head has a rubber covering to absorb shocks.



GARRETT WEEKENDER

G O L D D R E D G E

Good Combination of Weight and Power

BY JIM WALKER



If you aren't familiar with the terms "surface suction dredge," or "portable gold dredge," never fear. You may have already seen these tools at work. Those guys you saw in wetsuits, vacuuming up stream bottoms, were using them.

Surface suction dredges are simply floats with engines that drive pumps which pull water through hoses into sorting trays or riffle boxes. Along with the water comes small rocks, sand, gravel, coins, particles of gold or silver, or other objects small enough to fit through the nozzle of the hose. The sorting trays capture heavy items, the sand and gravel pass on back into the stream.

The size of a dredge is determined by the inside diameter of the main suction hose, and ranges from 1½ to 12 inches.

Of course, larger hoses mean larger dredges overall, and consequently for a dredge to be portable, especially back-packable, smaller sizes are best.

The Garrett Weekender Gold Dredge has a two inch diameter suction hose. Combined with its 1.2 horsepower, two cycle, FujiRobin engine this gives the Weekender just the right combination of reasonable weight (56 pounds with full suction nozzle setup) and power (up to 35 gallons of water pumped per minute) to sample those hard to reach locations. With the standard hoses, dredging is limited to a depth of about nine feet—more than enough for most applications. Longer hoses are available.

While a two inch portable dredge isn't all that unusual, the Garrett Weekender

has some especially nice features:

Although some portable dredges use an inflated inner tube for a float, the Garrett Weekender uses a tough, polyethylene, pontoon-style float. What this float may lose in portability (after all, any float is larger than a deflated inner tube) it makes up for in balance, durability and ease of setup. The float is contoured to curve around the carrier's back, and padded, adjustable shoulder straps clip to the underside. The Weekender travels almost ready to use—you only need to attach a hose or two.

One aspect of the float I particularly liked was that it seemed immune to tilting caused by buildup of gravel in the riffles; changing the speed of water running through it; or currents (problems often

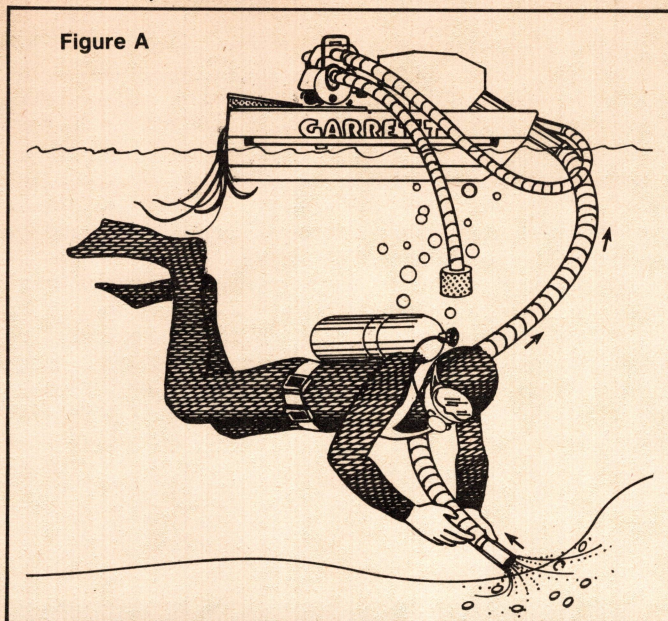


Figure A
Here the dredge is set up in the power jet mode (note the short hose from pump to Y coupling). The treasure basket is in use.

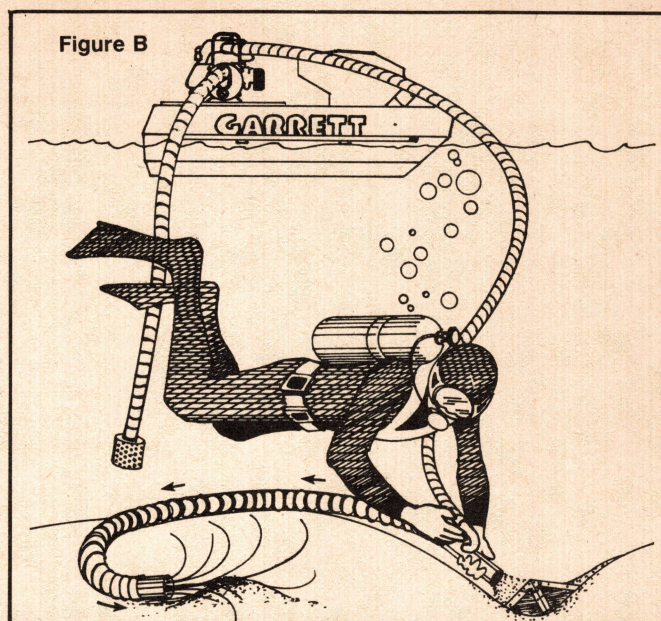


Figure B
Here the dredge is being used in the suction nozzle mode but the main hose has been uncoupled from the dredge to move sand.

encountered with tube floats). Although the engine position is adjustable for balance, I found this unnecessary. The riffles stayed correctly positioned at all times.

Another major feature of the Weekender is that it can be set up in a variety of configurations. With simple alteration of the standard hose hookups, the dredge can be used in the power jet mode (Figure A) for faster dredging, the suction nozzle mode (see photo) for shallow water use, or as an excavator (Figure B). With an optional blaster nozzle the dredge can be used to uncover buried objects. For coin hunting or recovery of jewelry, etc. the optional treasure basket replaces the riffle tray and can be used with either the suction nozzle or power jet modes. This would be of special interest to those dredging around wreck sites.

Setup of the Weekender is easy: The engine slides into a track and is secured (at any position on the track) by tightening four bolts. The riffle tray or treasure basket slips into the float and is secured by one snap-over clasp. The hoses are secured by simple, screw-tightened hose clamps. The only tools necessary are a medium size, flat blade screwdriver and a 7/16 inch open ended wrench. For backpacking, the hoses are uncoupled and coiled around the engine—held in place by rubber stretch cords. (It is recommended that the fuel tank be empty during transport.)

Before storage, the dredge should have all the grit rinsed off, and out of the pump, and be allowed to dry thoroughly. If operated in salt water, the dredge should be carefully rinsed with fresh water immediately after use and all parts subject to rust should be kept coated with a light oil.

While dredging stream bottoms is easy, finding gold or other valuables requires a little planning and technique. The Weekender comes with basic instructions on how to go about this (included in the very complete instructions for the operation of the engine/pump and dredge), but the treasure seeker should study up a little on the subject. Various books on dredging and panning are available at Garrett dealerships and at other treasure equipment suppliers.

The Garrett Weekender Gold Dredge is a durable, well designed system. I was

impressed with its ease of operation, power and sturdy construction. Except for some clogging of the main hose in the power jet configuration (caused by my overeager vacuuming technique), I found it to operate flawlessly.

The Weekender retails for \$795 and comes with a limited one year warranty on the engine/pump. For dealer information call one of Garrett's toll free numbers: (800) 527-4011, or in Texas (800) 442-4889. You can write to Garrett Electronics, at 2814 National Drive, Garland, Texas 75041.



photo/Jim Walker

Above: The Weekender Gold Dredge has a permanent float which provides stability and ease of setup. Left: The optional treasure basket can be inserted in place of the standard riffle tray. Opposite page: Dredge in suction nozzle configuration. The dredge has padded, clip-on straps so it can be backpacked.

The new Nikon Nikonos 15 mm lens, officially the "UW-Nikkor 15mm F 2.8N Lens," has a new look. Although it has the same overall configuration as the older model, the new lens body protrudes about 1 1/16 inch further from the camera body. This additional length accommodates the new retrofocus design which allows this lens to be used with the Nikonos IV-A automatic exposure control. With the older model 15, the lens elements extended into the camera body and blocked the internal light path of the built-in exposure metering system.

Because of the additional length, the aperture, focus and depth of field scales,

located beneath a curved plastic port on the right side of the lens, are now farther out from the camera body. The plastic port is wider, and the black index mark for setting aperture and focus is significantly larger. Thus, we found that reading the settings is much easier with the new lens. If you have old eyes, however, you may still wish to apply a small spot of white paint on the lens housing next to the index mark. We usually recommend this modification with the older 15 mm lenses as a guide to finding the mark.

The lens shade is cut back at the left and right sides and forms visors at the top and bottom. The open areas prevent

the shades from showing up in the corners of the picture area, and allow you to grip the lens cap as you screw it in or out of place. And, even without the front lens cap in place you can rest the camera and lens face down on the visors. But with the IV-A, if you open the camera back, balance will be precarious and the camera can fall over easily.

The basic operating procedure is unchanged. The new lens attaches to the camera body with the same bayonet lock, and the aperture and focus control knobs are in the same positions on the bottom and lower left (as you hold the camera). The scales are virtually in the same posi-



15^{NEW}mm LENS

**for the
Nikonos
IV-A**

**TEXT AND
PHOTOGRAPHY
BY JIM AND CATHY
CHURCH**

tions, and both the aperture and focus ranges are the same as with the older model. The apertures, from f2.8 to f22 in full stops, have click stops at each marking so you can change aperture without having to look at the scale. Focus is from 0.3 meters (1 ft.) to infinity, and the depth of field subscale shows depth of field markings for distances of 0.7, 0.8 and 0.9 feet from the film plane.

The wide-angle U/W viewfinder has one modification: An indentation has been made on the left side of the vertical yoke that attaches the viewfinder to the camera body. This allows you to see the LED display of the Nikonos IV-A. When using the automatic exposure control, simply lower your eye downward, in line with the left side of the viewfinder yoke, and you will see the red LED (light-emitting diode) inside. And, although the instructions with our particular lens stated that the flash ready light in the camera viewfinder can't be seen when the accessory viewfinder is attached, we were able to see it. It was much easier, however, to simply glance over at the ready light on the back of the flash head.

The large viewfinder is truly a joy to use underwater. It produces large, bright and sharp images, and you see 90 percent of the actual underwater picture area the lens covers. Thus, because the actual area is slightly greater than what you see, you are less likely to amputate part of your subject. But on the other hand, you are more likely to make the error of photographing from too far away.

The parallax correction (where the lines of sight of the viewfinder and lens intersect) is at five apparent feet. Closer, you can adjust for parallax by aiming the viewfinder a couple of inches above the intended center of your subject. Farther away, it doesn't matter because the picture area is so large.

Because the optics are corrected for underwater use, you will see blurred images if you look through the viewfinder in air. And, if you aren't expecting this, it could cause your heart to skip a beat or two. The lens is also corrected for underwater use and will produce blurred pictures in air.

If you have an older 15 mm lens or Nikonos camera body, you are probably wondering if the lenses, viewfinders and camera bodies are interchangeable. The answer is yes! We have attached the new lens and viewfinder to Nikonos I, II, III and IV-A camera bodies, to which an SB-101 Speedlight bracket was attached, and everything fit perfectly. Likewise, you can use the older 15 mm lens and viewfinder with the IV-A camera body. However, you can't use the automatic exposure control for sunlight exposures and can't see the LED display in the camera viewfinder. If you already have an older 15 mm lens and

wish to add a new one to your camera system, you could have a notch machined in the yoke of the old viewfinder for use with the IV-A.

In the authors' opinion, the Nikonos 15 mm lens is one of the finest wide-angle lens systems available for underwater 35 mm photography. The viewfinder produces larger and brighter images than any 35 mm SLR, and the dome port optics are superb. The Nikonos 15 mm lens is probably the most widely used wide-angle lens system for professional underwater photographers. As for disadvantages, the new Nikonos 15 mm lens is heavier in air (1.4 pounds vs. 11.3 ounces) than the older 15 mm lens, and is also slightly heavier underwater.

The UW-Nikkor 15mm F 2.8N Lens retails for \$747.50, and the Optical UW Viewfinder retails for \$235.95. For more information, write directly to Nikon, Inc., 623 Stewart Ave., Garden City, New York 11530. 

The new Nikonos 15 mm lens will do everything the former version will, but in addition it will work in conjunction with the automatic mode of the Nikonos IV-A camera. The new lens will fit earlier Nikonos models as well. The new lens body protrudes about 1 1/16 inch further from the camera body, and this additional length allows the aperture, focus and depth of field scales to be set beneath a curved plastic port on the right side of the lens. The protective lens shade is cut back to form visors at the top and bottom.

MANUFACTURER'S SPECIFICATIONS UW-Nikkor 15mm F 2.8N Lens

Focal length.....	15 mm
Lens construction.....	12 elements in 9 groups
Aperture range in full stops.....	f2.8 to f22
Underwater picture angle.....	94 degrees
Focusing scale.....	0.3 m (1 ft.) to infinity
Depth of field subscale.....	0.7, 0.8 & 0.9 ft.
Focus calibration.....	underwater apparent distance
Dimensions.....	93 x 90.6 mm (3.7 x 3.6 inches)
Weight in air.....	655 g (1.4 lbs.)

OPTICAL UNDERWATER VIEWFINDER

Lens construction.....	3 elements in 3 groups
Frame coverage.....	90 percent of picture area
Parallax correction.....	1.5 m (5 ft.), apparent dist.
Dimensions.....	92 x 215 mm (3.6 x 8.5 inches)
Weight in air.....	Approx. 600 g (1.3 lbs.)

USING THE NIKONOS 15 mm LENS

The wide-angle Nikonos 15 mm lens has an underwater diagonal picture angle of 94 degrees and two primary purposes: First, it allows you to photograph large subjects you couldn't photograph with your 35 mm or 28 mm lens. And, second, with smaller subjects, it allows you to reduce the camera-to-subject distance. This reduces the amount of water and suspended particles you must photograph through.

The key to using a 15 mm lens is to get close and compose your picture through the viewfinder. Look from corner to corner and side to side, and fill the viewfinder with your subject. The most common mistake is to compose the picture by eye while looking over the top of the viewfinder, and then raising the viewfinder and using it as a sight to aim the camera for the exposure. Thus, because your eye didn't see the scene with the same perspective as the wide-angle lens, you will be taking your pictures from too far away. The second most common mistake is to attempt to photograph subjects that are too small. Yes, you can focus down to one foot from the film plane, but you usually need subjects at least the size of a basketball.

If you use the Nikon SB-101 Speedlight with the Nikonos 15 mm lens, we recommend setting the speedlight for 1/4 power and placing the SW-101 wide-angle diffuser over the front of it. This softens the light and spreads it over the picture area of a 28 mm lens. While this doesn't cover the larger picture area of the 15 mm lens, you can add fill lighting to the central picture area. By holding the strobe off the bracket, and aiming in from above and from the side, the beam is spread out even further.

In tropical waters, we usually use a separate exposure meter to determine a sunlight exposure and then hold the SB-101 back at the proper strobe-to-subject distance so the strobe exposure is slightly less than the sunlight exposure. This produces pictures with a natural appearance, but with a touch of strobe lighting to bring out color and detail.

If you use the automatic exposure control of the SB-101, remember that the narrow angle of view of the sensor won't see or respond to the bright surface above if you are working in shallow water. And, if your automatic control tends to overexpose, change to a higher numbered f stop.

DIVE BOATS

STAMAS 24 TARPON

A Mini Yacht For Overnight Dive Trips

**TEXT AND PHOTOGRAPHY
BY STEVE LUCAS**

Diving is changing and the needs of today's more sophisticated diver are changing just as rapidly. As recently as 10 years ago almost any boat stable enough to get the underwater enthusiast to the dive site was more than sufficient. That is certainly not the case today.

For some the basic open fisherman will do, but for many a splash of luxury makes the dive day even more enjoyable. To many that luxury must include the ability to live aboard for short periods with plenty of storage room. A large ocean going yacht would be perfect, but for most is untouchable owing to the price. What is needed is a good, trailerable mini-yacht under 25 feet in overall length. To that end, enter Stamas Yachts, Inc.

Over the years the name Stamas has become synonymous with excellent ocean going power boats. Builders of some of the finest offshore fishing and cruising yachts available today, the company's expertise in larger boats is now available to the diver in the form of a near perfect mini-version: The 24 foot Tarpon Walkaround Fisherman. With an actual overall length of 25 feet 3 inches owing to the bow pulpit extension, the cuddy cabin design offers the overnight diving enthusiast a tough, trailerable boat that has an amazing amount of storage.

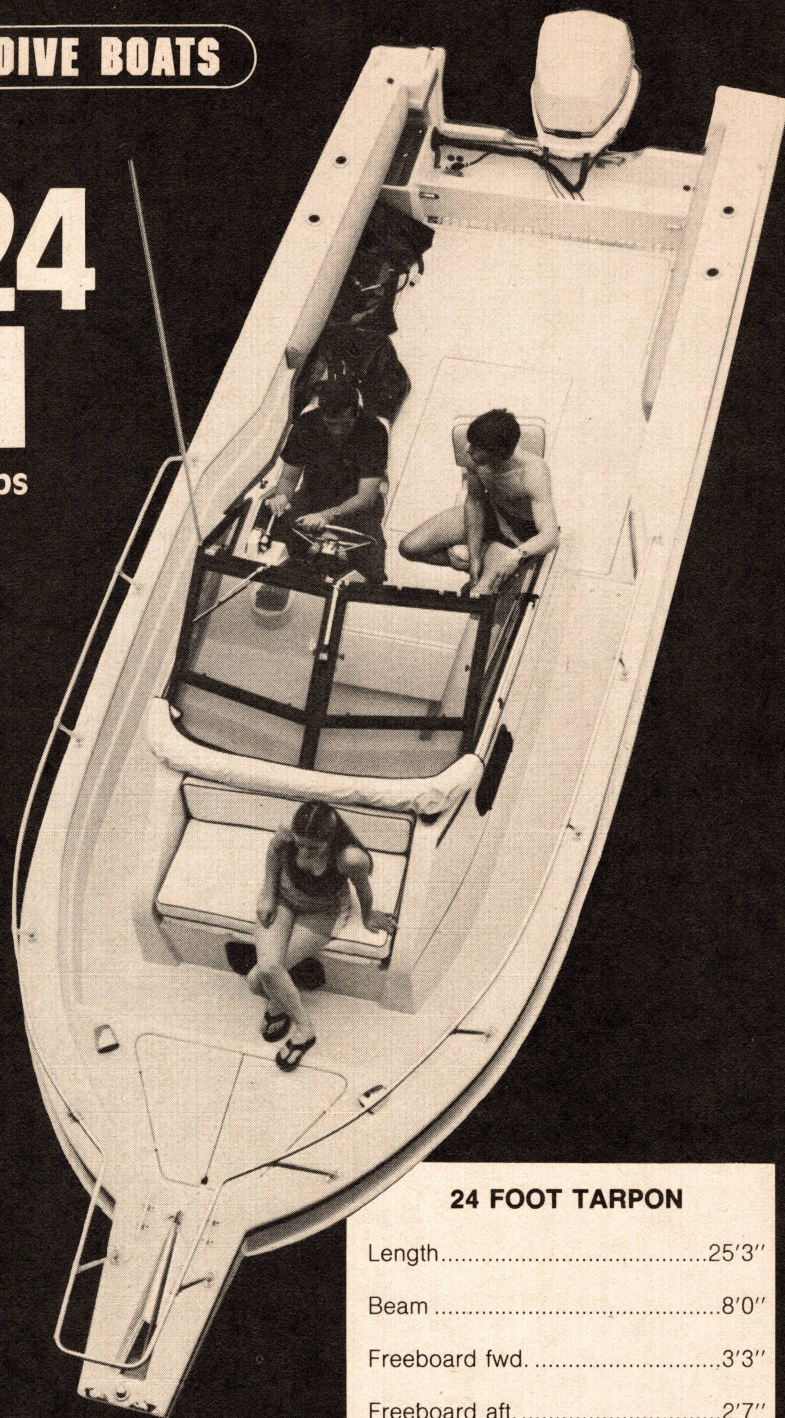
Divers will immediately be impressed by the massive storage compartment just aft the twin helm chairs. This main locker is designed to hold large amounts of fish, but doubles as space to store several large gear bags or nearly a half dozen tanks. With a length of 46 inches, the locker is 28 inches wide and 20 inches deep. That converts to nearly 15 cubic feet of storage in one locker. In the Tarpon it is only the beginning. Directly behind the helm chairs are twin lockers that can easily hold smaller gear such as masks, fins and regulators. With some padding these would be ideal for underwater camera equipment. Since they are insulated, one or both can also be used

for storing food and beverage for a reef trip of several days.

Storage does not stop there. In addition to the double hatch anchor locker recessed below the forward deck, there are three more large lockers beneath the V-berths inside the carpeted cuddy cabin. The cabin is unusually spacious for a boat of this size and can be used to keep not only you and your passengers out of the elements, but equipment such as radios dry as well. For overnight trips two people can sleep with comfort on the cushioned V-berths. If you are willing to give up some of the storage you can add one of two optional marine heads. One is portable, the other is built-in with a manu-

al holding tank for user convenience.

Getting to the offshore islands should prove to be no problem with the deep-V design of this streamlined hull. The outboard model has an 111 gallon twin tank fuel capacity. With stern drive or sea drive models the fuel capacity is slightly reduced owing to the space reduction,



24 FOOT TARPON

Length.....	25'3"
Beam	8'0"
Freeboard fwd.	3'3"
Freeboard aft.	2'7"
Hull draft	12½"
Weight	3500 lbs.
Fuel capacity	111 gal.

but is more than adequate at 71 gallons.

The Tarpon offers plenty of room both above and below deck and there is still nearly 13 feet of cockpit area despite the cuddy cabin. The deck can be accessed through a hatch in the front of the cabin as well as through the teak, louvered doors. The top of the cabin deck hatch is cushioned, making it also usable as seating. The forward deck is surrounded by an aluminum bow rail, one of the only problems we noted. More serviceable stainless steel railing is not offered, even as an option.

The hull design is quite seaworthy. Combined with the 25 foot plus overall

length is a full 8 foot beam. The forward freeboard puts the bow well over the water at 3 feet 3 inches while the aft freeboard is still 2 feet 7 inches. With a hull draft of less than 13 inches the boat is capable of negotiating the shallows as well as heading for the deep water.

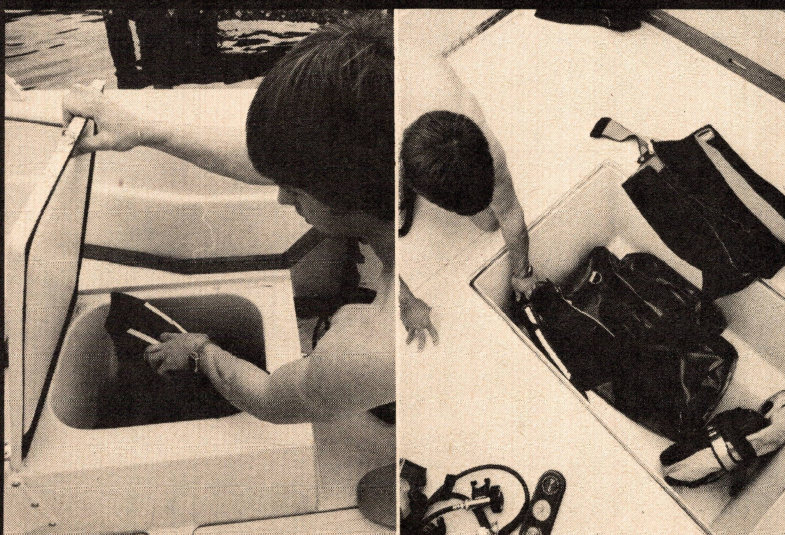
Other notable pieces of standard equipment are; 1) bilge pump, 2) foam flotation, 3) complete instrumentation, 4) international navigation and anchor lights, 5) self-bailing outboard motor well, 6) teak speargun (rod) holders and 7) tinted, tempered windshield safety glass. Options can include; 1) hydraulic steering, 2) 110 volt shore power, 3) swim/

dive platform, 4) Bimini top and some two dozen other options for customizing the hull to your particular needs.

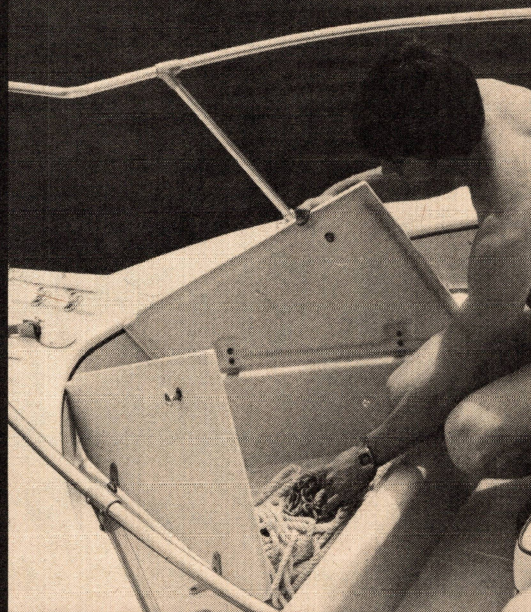
In the standard outboard configuration the 24 foot Tarpon has a base price of \$18,390, less engine and trailer. With a Mercury/OMC 260 hp stern drive, including power steering and trim, the base price is \$29,390. Dealers are nationwide. If you are looking for a classy little mini-yacht and cannot locate a Stamas dealer readily, the factory will be happy to provide you with the name of one near your home. Write: Stamas Yachts, Inc., 300 Tampas Avenue, Tarpon Springs, FL 33589; (813) 937-4118.



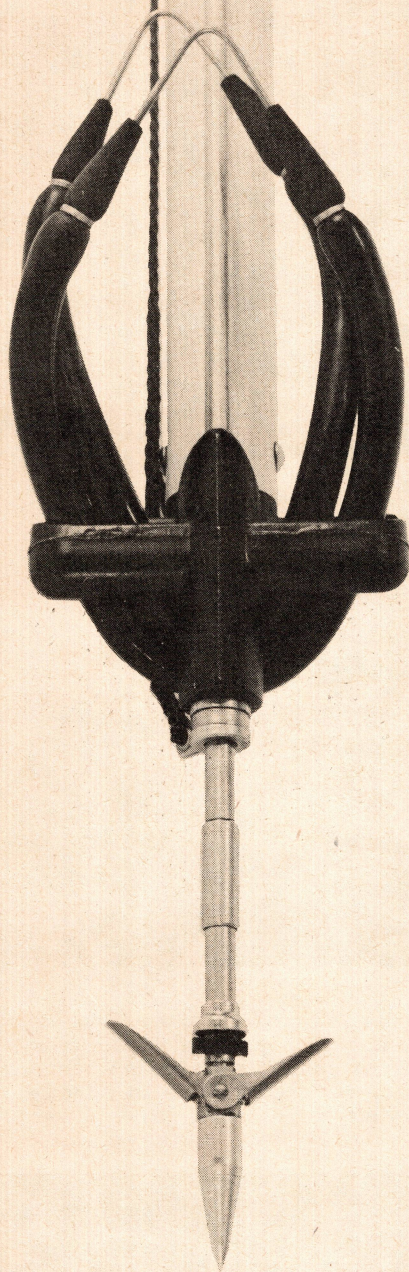
The Stamas 24 foot Walkaround Fisherman has wide open deck space and a cuddy cabin which can comfortably sleep two in V-berths. The Tarpon can accommodate an outboard motor, stern drive or sea drive power.



In addition to three large storage lockers under the V-berths in the cabin, the Tarpon has a huge storage compartment (nearly 15 cubic feet) just aft the helm chairs, two insulated lockers (also behind the helm chairs), and a double hatch anchor locker in the forward deck.



TEXT AND PHOTOGRAPHY BY FRED FISCHER



If you missed spearing your dinner, chances are the best quality fresh fish will be found at a market right on the docks. Likewise if you are searching for the right speargun, the best gun may come from a company which makes only spearguns. JBL is such a company. It was founded in 1981 by Joe LaMonica who designed and built quality spearguns for Swimaster in the '60s. One of JBL's best selling guns is the 38-Special, introduced only last year. It is a hollow aluminum tube design which measures 42 inches overall. The 5/16 by 28 inch stainless steel shaft with six millimeter threaded twin spinner point is ejected by two one-half inch black rubber slings.

Close inspection of the 38-Special reveals attention on the part of the designer to function and durability. The handle and muzzle are made from black anodized, die cast aluminum. Upon removing the handle from the hollow aluminum body I found the tube to be free flooding—this causes the gun to remain negatively buoyant even after the shaft is discharged. If the spearfisherman desires a floating gun, a set of double O-ring sealed plugs is available.

The draw on the slings is routed from under the muzzle to a direction parallel to the shaft for stability and accuracy. The 120 inch polypropylene shock cord runs snugly along the side of the barrel to the right side of the grip where it doubles back twice from a spring loaded release lever. Snaring of the line is minimized by a guard near the release lever and by keeping it as close to the barrel as possible. A well marked safety switch is on the left side of the grip above and behind the trigger. The lever is especially quiet. It is moved up with the thumb. The trigger mechanism is kept simple for reliability. Any prefires will be the result of a damaged or worn shaft and not the 17-7 PH, heat treated steel sear. A six inch hollow

butt stock fitted with a round rubber cap is provided for ease of loading and convenient storage of spearpoints.

The 38-Special is ideal for most spearfishing situations. It is short enough for easy traveling and allows the diver to maneuver in grass, rocks and coral. The stock slings require about 75 pounds of pull for loading and have plenty of punch for the limit of the shock cord. Positions for only two slings are provided, since the addition of any more could cause the shaft to become unstable when fired.

JBL provides a full range of accessories for the 38-Special and the nine other spearguns in their line. The hard rock tip of the twin spinner point can be replaced with a sharper tri-cut tip for open water fish. For soft flesh fish a new three wing point is available. Other six millimeter tips include paralyzers, tridents and breakaways. A reel is also available.

Because of the rugged nature of the 38-Special maintenance is minimal. It is recommended, however, that the gun be rinsed in freshwater after use and the slings and rubber section of the shock cord be sprayed with silicone to reduce attack by ozone. A limited one year warranty is provided on the gun's metal parts. JBL dealers are specially trained to service the gun and should carry a stock of spare parts and accessories. Sales manager Ron Pavelka informed me that dealers are also trained in the art of spearfishing by JBL. If you have any questions regarding the type of equipment necessary for taking a particular fish or even the general spearfishing climate of a part of the world you plan to visit, ask the JBL dealer. If the answer is not available there is a toll free line to JBL where a knowledgeable staff member may be able to help.

The 38-Special is a versatile and well built speargun available from JBL dealers at a suggested retail price of \$99.95.

JBL's 38-Special

*Ideal for most
spearfishing situations*

The JBL 38-Special measures 42 inches overall. The body is aluminum tubing and the handle is black anodized, die cast aluminum.





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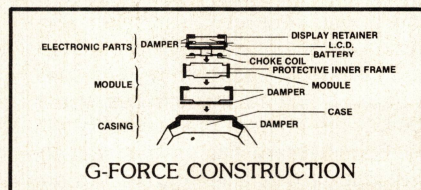
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The **G-FORCE** is constructed of rugged, lightweight black polysulfone for the band and outer frame and stainless steel for the inner frame. It's yours for only **\$69.95**. The all-stainless model **DW-1000** and stainless case and resin band model **DW-1000C** are **\$69.95** and **\$59.95**, respectively. These two quartz beauties offer all the functions of the **G-FORCE** except 33-foot shock resistancy.

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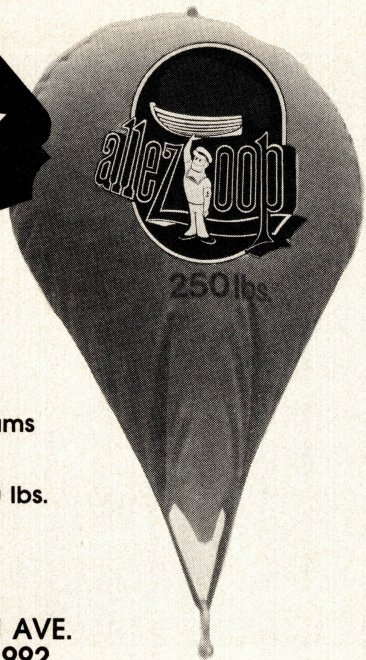
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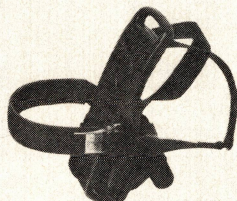
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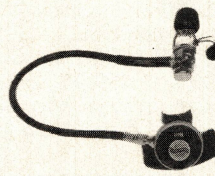
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TECHNIFACTS

(Continued from Page 43)

Squalus went down and we were at Hampton Beach, NH, at the time. We went out to the scene but were told to get away...." Signed, Barney Murphey.

Another man who was there wrote, "I was 16 years old when the *Squalus* went down and lived in York Beach, Maine. My dad had a 50 foot fishing boat at the time and he came and got me out of school and we took people out and witnessed the first load of men come up in the rescue bell. It was one of the great thrills of my life. Boats that had horns blew them and people cheered and applauded."

Russell A. Philbrick wrote: "The only man that I knew on the operation was Chief Boatswain Ullman, skipper of the tug *Penacook* out of the Portsmouth Navy Yard. I went to school with his son and daughter. I talked to them both this year (1982). Charlie lives in Miami, Florida and Jeannie lives in Playa del Rey, CA. We made other trips to the *Squalus* job and were there when she broke the surface on the first salvage attempt."

The tug *Penacook* played a critical role in the rescue of the survivors of the *Squalus*. She left Portsmouth with Admiral Cole on board; he would take charge of the rescue and salvage of the submarine. On arrival, the *Penacook* was ordered to make wire drag runs in the general area in which the *Squalus* had sunk. Skipper David Ullman did his usual fantastic job and snagged the *Squalus* thus permitting attachment of the downhaul cable by Sibitzky and ultimate rescue of the crew.

From San Diego, James "Ace" Parnell, a Navy diver on board the *USS Ajax*, wrote, "Your latest article in SKIN DIVER was well received and of high interest on board. Keep them coming, ER."

A final letter that might be of interest to readers was received from Ken Simmons, Houston, Texas. "While attending Divers Institute of Technology we studied the *Squalus* during the salvage theory portion of the course. We viewed a U.S. Navy documentary film on the salvage and rescue. It was a very good film and was quite detailed on the problems encountered and their eventual solution."

As mentioned previously, the story of the salvage of the *Squalus* will be published in a future issue of SKIN DIVER. In it you will be able to follow the 640 dives made by 53 tough Navy divers as they wrested the stricken submarine from 240 feet of very cold Atlantic water. They were banged, bruised, bent and in general a beat up crew of divers when the job was finished. But the job was completed and that was the bottom line for these men of the sea. >

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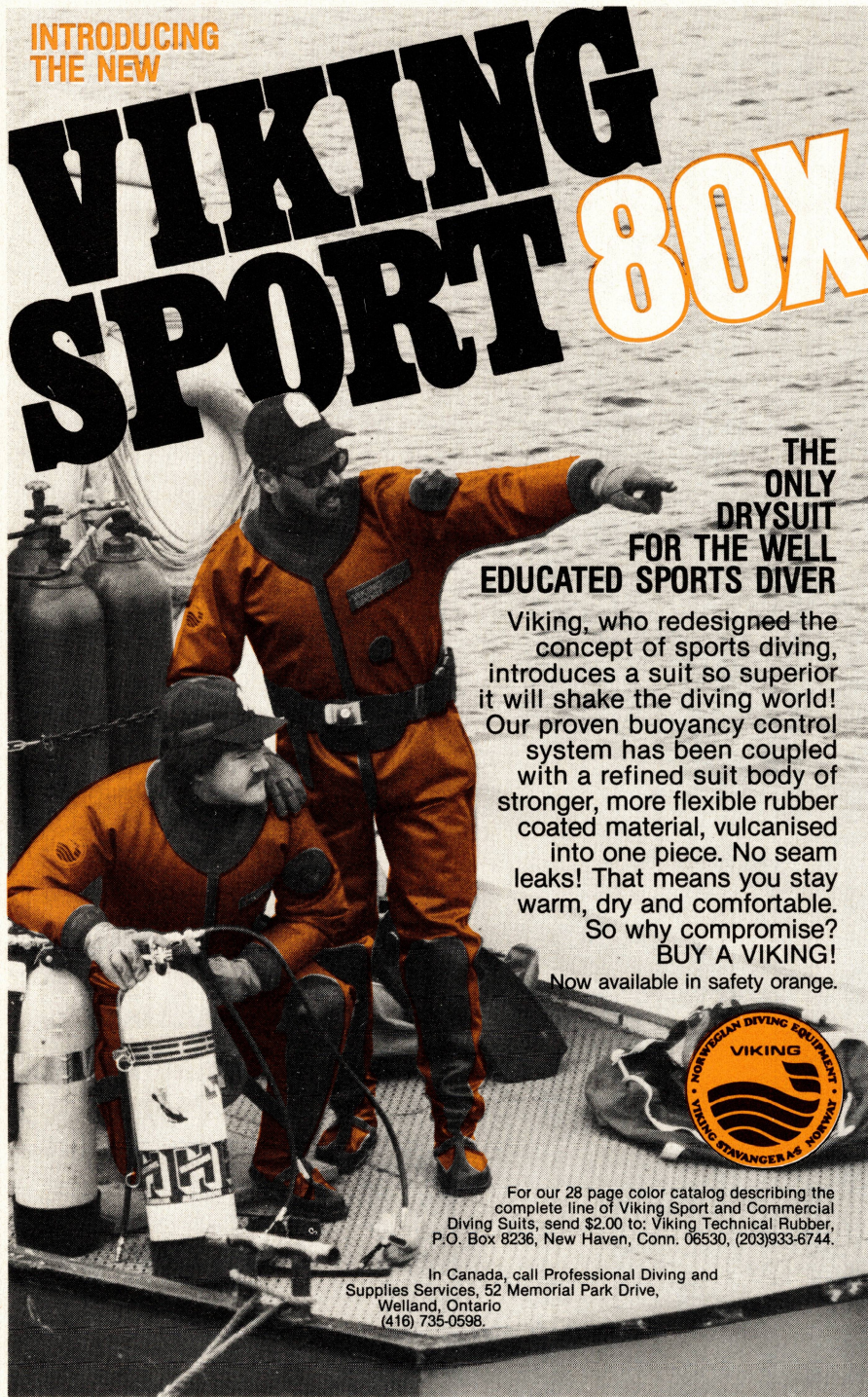
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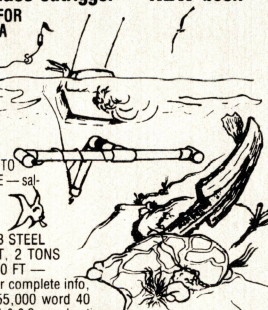
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NEW HAWAIIAN REEF

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sweeper Sunk Off
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U/W Laboratory

BY DOUG WALLIN

The waters around the Hawaiian Is-
lands contain a few artificial reefs—
ships, planes and other manmade prod-
ucts which have sunk in shallow water
and become home to a myriad of colorful
and fascinating marine creatures. Most of
these artificial reefs are the result of acci-
dental occurrences: derelict remains of
World War II in the Pacific, maritime mis-
haps or the sometimes violent moods of
weather in the sub-tropical Pacific.

In 1982 something new happened to
Hawaii: The first large scale *planned* arti-
ficial reef was created. The M/V *Mahi* is
a 165 foot, 600 ton vessel, originally built
for the Navy as a minesweeper and later
converted to an oceanographic research
vessel used by the University of Hawaii.
No longer seaworthy, the *Mahi* was due



photos/Ken Taylor

to be sunk in deep waters off Honolulu,
never to be seen again. That was the
plan, until a group of local divers and dive
shops got together and convinced offi-
cials that the ship should instead be sunk
in shallow water: A gigantic underwater
laboratory where marine biologists and
dive enthusiasts could watch the growth
of a reef firsthand.

Artificial reefs are certainly not a new
concept. As early as 1800 South Carolina
fishermen noted that catches of sheeps-
head were declining steadily as the for-
ests on the barrier island were being cut
down and the land cleared for cultivation.
Formerly these fish had been taken in
large numbers around trees which had



situation when catches declined. They built structures to replace the fallen trees and floated them to the areas where they had previously caught the sheepshead. The structures were sunk by filling them with rocks. Within weeks, as the barnacles and other growth formed, the sheepshead returned and anglers again began making good catches. Close to 500 reefs have been built off U.S. coasts in the past 40 years. Most of these artificial reefs are made from weighted scrap placed on the ocean floor. These attract bottom fish and crustaceans, which in turn draw other marine life.

Artificial reefs have proven successful, yet only play a minor role in fisheries development in this country. In Japan, on the other hand, artificial reefs receive major emphasis and funding because of their importance to current methods of habitat improvement. By increasing the amount of rough bottom, artificial reefs provide the potential for increasing the total number of reef fish and improving fishing. The division of fish and game of Hawaii initiated studies on artificial reefs in 1957 to determine the effect of these manmade reefs on the standing crop of fishes. A 16 fold increase, by weight, of fishes occupying one site after the addition of concrete shelters encouraged Hawaiian biologists to begin constructing a series of artificial reefs primarily using car bodies and damaged concrete pipe.

fallen into the water along the gradually eroding bank of the island.

The South Carolina fishermen were not the first to recognize that irregular bottom protuberances such as submerged trees,

reefs, rocks and shipwrecks were good places to find fish. That has been common knowledge among anglers for centuries. But the South Carolina fishermen were among the first to try to correct the

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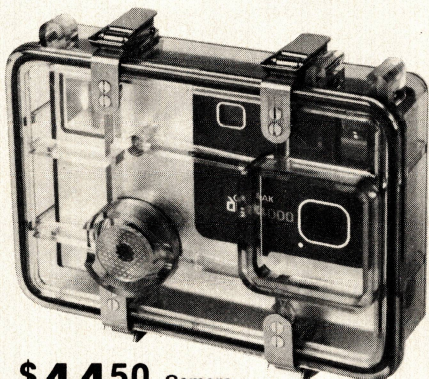
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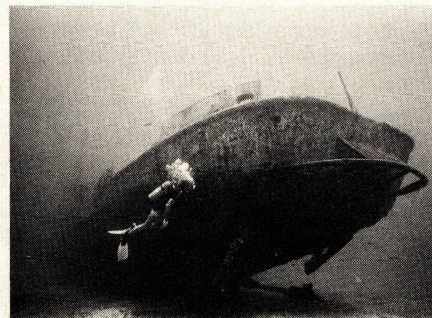
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NEW HAWAIIAN REEF

The *Mahi* was a slowly rusting derelict, sinking at the dock, not even worth the scrap metal she contained. This at least was how local officials saw the vessel—not so a group of local divers and dive shop owners headed by Ken Taylor, professional diver, underwater photographer and owner of South Seas Aquatics. What better end for the old warrior *Mahi* than to be placed beneath the rolling waves nestled amid the bottom dwellers, making a place for the wayward population to call home! The making of an artificial reef might almost sound easy: Find an old ship ready to be scraped, tow it to a suitable location, fill it with water until it sinks. Easy, right?

Wrong. The incredible scenario of the *Mahi* goes something like this:

In actuality, Ken Taylor had been trying for some time to find a large vessel to turn into Hawaii's first large scale artificial reef. The delay was not for lack of worthy candidates—vessels due for scraping are common in a water-locked area such as Hawaii. Ken had literally spent years trying to get one ship as an artificial reef. He



was turned down on every bid, and it was beginning to look hopeless.

Then, in early 1981, Ken discovered the *Mahi*. The state was preparing to dispose of the ship as junk by towing it some 12 miles south of Honolulu, blowing it up with explosives and letting it sink in 500 feet of water. Ken envisioned a far more fitting end to the old warrior. At long last he had found an artificial reef.

But finding the right vessel, and acquiring her, were two entirely different things. Red tape in quantity sufficient to fill the 165 foot vessel first had to be plowed through before the ship would be released by the state and Coast Guard. The first headache was to raise the money required to purchase the derelict. This was quickly solved, however, by generous civic contributions by members of the diving community in Hawaii. Donations were received from the following companies: South Seas Aquatics, Rann, Clarke Sales, American Dive Tours, Aloha Dive Shop, Hawaiian Divers, Waikiki Diving and Hawaii Sea Adventures.

Almost disbelieving after years of failed

attempts to acquire a vessel, Ken Taylor at last held the ownership papers to the *Mahi*. The only thing left was to turn her into an artificial reef. That's when the real work began.

Ken soon learned that one does not merely purchase a ship, tow it out to sea and sink it where one likes. First came another ship full of red tape. And lastly, before the Coast Guard would release the ship, all signs of oil had to be soaked up from her holds and decks—no easy task on a 165 foot boat. The next job facing Ken and his crew of local diver volunteers was to make the *Mahi* seaworthy enough to be towed out of the harbor and to her new home many miles down along Oahu's leeward coast. As it turned out, the vessel was already getting some practice at being an artificial reef—it had sunk at the dock! Refloating the derelict was a laborious task requiring all holes in the hull below the waterline to be located, then patched. After this was accomplished, it took a full 24 hours to pump out the water and get the *Mahi* back on the surface again. Before the ship could be towed, official red tape caught up with the project, requiring yet another three weeks of paperwork. During the interim, the ship sank again. She might have been christened a minesweeper, but she was acting more like a submarine. After another three days of effort, the *Mahi* was floated off the bottom of Honolulu Harbor and at long last was ready for her final voyage. It was not uneventful.

The tugboat used to tow the *Mahi* was donated by Jimmy Smith, the operator of a commercial diving and tugboat company. As the tugboat was making the turn into the main channel, it hit an unmarked mud bar and stopped dead in its tracks. The towed *Mahi* was still underway, and with no way of stopping her, she hit the tug in the stern, forcing it farther onto the mud bar. A second tug had to be brought in to free the first tug, then both labored for 30 minutes to get the *Mahi* off the mud bar. Excitement ran high among the artificial reef building volunteers as the ship at long last cleared the Honolulu Harbor, and was towed over open ocean to her final resting site. Everyone just hoped the old vessel would stay afloat long enough to get there. As of late, she had displayed a great proclivity for sinking!

The towing operation had begun at sunrise that day, and by 12:30 pm the *Mahi* had finally reached its destination, just offshore Maile Cove; the reef site which had been approved by the Coast Guard and the Fisheries Department. The only thing left was to sink the ship on target. After all the times she had filled with water and sunk at the dock, it appeared as though she were anxious to be submerged. Perhaps it was the ship's moody senility or merely a final gesture of playfulness with her human friends, but the old boat did a funny thing—it wouldn't sink! Hours later the tugboat was still

(Continued on Page 85)

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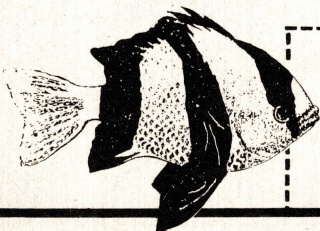
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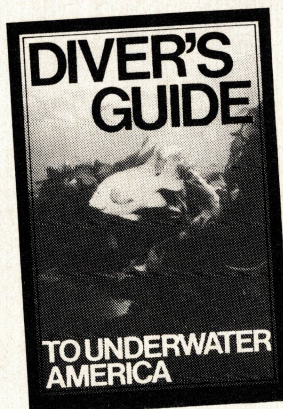
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SUPER WRECK

(Continued from Page 33)

who also became enamored of the project. Permission was obtained from the Bahamas government to sink the ship at a site designated by UNEXSO which would be easily accessible to the sport diver but not a hazard to navigation. Finally on October 16, 1982 the ship was scuttled. Some large holes were cut in its sides and the ballast tank valves were opened to flood the hull.

The sinking took four hours, much longer than anyone involved in the project had predicted. Ideally, the ship was to sit in the midst of a wide sand ledge at about 100 feet so as to permit safe bottom times and not damage existing coral heads. However, because of the excessive time required to sink the vessel, she drifted somewhat. In fact, she finally came to rest on her port side with the

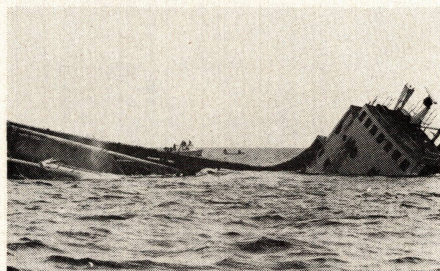


bow at 95 feet and the stern at 110 feet directly on the edge of the ledge, a vertical precipice which drops to 7000 feet. Had the ship drifted another 100 feet seaward, she would have likely been lost forever. As it is, the propeller and rudder are dramatically perched on the wall with the feeling of infinity below.

Because the wreck is so recently sunk, there isn't a great deal of colorful encrustation as yet. There are some hydroids and the beginnings of coral growths, and the fish are beginning to consider the wreck their habitat. Having made a recent pilgrimage to one of the premier wreck diving destinations of the world, Truk Lagoon, I couldn't help but compare the bald superstructure of Theo's Wreck (as the *Island Cement* is now called) to the magnificently adorned hulls of the Japanese Imperial Fleet at Truk. While the colors are certainly more impressive on an older wreck, they begin to lose their identity as shipwrecks and appear more as coral reef. There is much to be said for viewing a young wreck, at intervals, to gauge how quickly the sea will inflict its will upon the works of man.

During our visit to Theo's Wreck we flew Bahamasair to Freeport and stayed at the very comfortable Lucayan Bay Hotel, next to the Underwater Explorers Society. Under the capable direction of John Englander, UNEXSO has become one of the most successful of Caribbean dive operations.

The divemasters and instructors on the UNEXSO staff are cordial and competent. They structure the dive to 100 feet for 22 minutes for a conservative no decom-



pression dive. Prior to diving the wreck, UNEXSO requires that the divers be certified, in possession of their C-cards, and have made one reef dive with UNEXSO. In addition, a pool check in the 18 foot training tank may be required, but that will be at the discretion of the divemaster.

The boat ride to the site usually takes 30 to 40 minutes, depending upon which of UNEXSO's fleet of boats is being used and environmental conditions. The crew anchors on the wreck and the divers descend the anchor line to it. This provides the greatest economy of bottom time and air and also provides security for those days when the current is running. As with any deep dive, a depth gauge and a bottom timing device are advisable. In this case, they are required by the dive operator as well and are available for rent if necessary. The 22 minute bottom time is sufficient to tour the wreck superficially, however several dives will be required to tour it thoroughly.

My visit to Theo's Wreck was all too brief. One dive, two rolls of film, and then back home. My memories are of graphic shapes and exquisite photographic potential. I'd love to get back there on a crystal clear summer day and work with the play of light and dark, and the many dramatic upward camera angles. It's a good wreck now and can only get better. Congratulations to the insight and cooperation of UNEXSO, the Bahama Cement Company, and the government of the Bahamas for creating an exciting new environment for dives. For further information regarding Theo's Wreck, contact UNEXSO, P.O. Box F2433, Freeport, Bahamas or phone (809) 373-1244.

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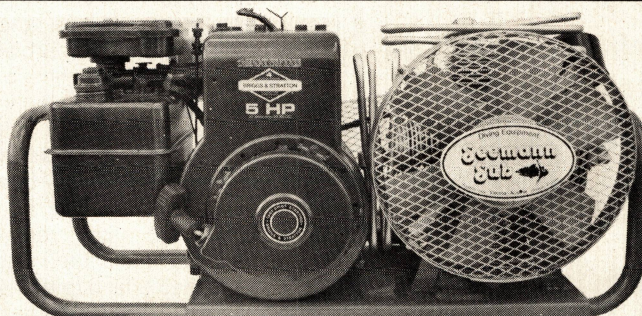
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lars in prizes awaited the anxious divers who were to dive off Cat Island, a large, picturesque island one and one-half miles off the coast of Marblehead, MA. The prizes ranged from fins to gauges to tanks to regulators. Seventy-six prizes were awarded by the end of the day.

Everyone arrived at Pickering Wharf in Salem, MA at 7:00 am to board the excursion boats. The *New England Star* took aboard 135 eager treasure hunters while the *Delta* was loaded with dive gear that astonished the captain: 200 tanks, 100 gear bags, 100 weightbelts, coolers, etc. As the boats headed out for Cat Island, the excitement mounted.

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prepared Cat for the largest event ever held on this most unique island. The grills for hamburgers, hotdogs, ribs and lobsters were organized; the cold refreshments and beer were iced down; and the 400 eight inch octagons, for which the divers would be diving, were scattered within the cove on the west side of the Island. All preparations were complete—just waiting for the treasure hunters to arrive.

The site was more than picturesque; multi-colored sailboats sailing among the islands, boardsailers gliding with the mild breeze, seagulls and blue skies, and 135 treasure seekers arriving on the island for a day of fun, excitement, socializing and adventure. New England Divers' Second Annual Treasure Hunt was underway.



Excitement intensified as the divers received instructions and rules of the Treasure Dive and signed in with dive-masters Barry Graham and Kathy Barlow. Meanwhile, Captain Pete Melski anchored his boat *Aquaventure* on the outer realm of the cove as the main safety boat. Others dropped anchor on each side of the *Aquaventure* to keep boaters at a safe distance. Safety divers were stationed on several of the boats as well as in the water and on shore.

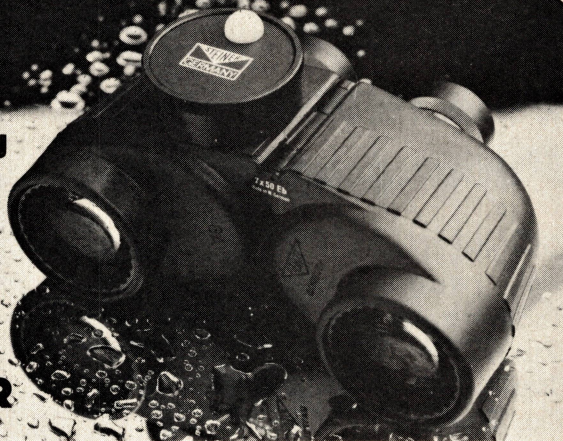
After buddy teams had signed in, they began gearing up and rehearsing their plans and tactics to find the most valuable prizes. The rules stated that each diver could bring up only five of the octagons; the only catch was they would not know what prizes they won until mid-afternoon. This is what made the treasure dive exciting and intriguing.

As the divers congregated by the water's edge, New England Divers' dive-masters took a second count, friends of the divers offered any final adjustments and advice and the cameramen began shooting once again. Shoulder-to-shoulder, tank-to-tank, 104 divers awaited the final starting signal.

It sounded like the Fourth of July as the fireworks went off signaling the start of the Treasure Hunt. Witnessing over 100 divers descend at one time with the same

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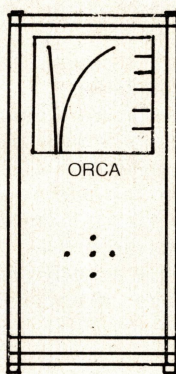


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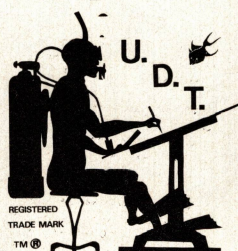
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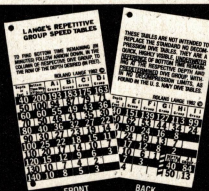
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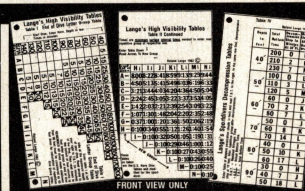


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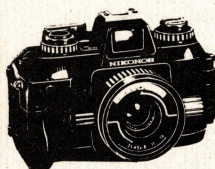


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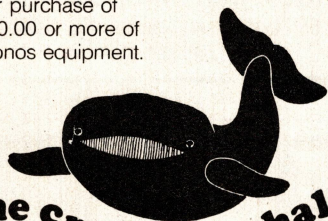
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TREASURE HUNT

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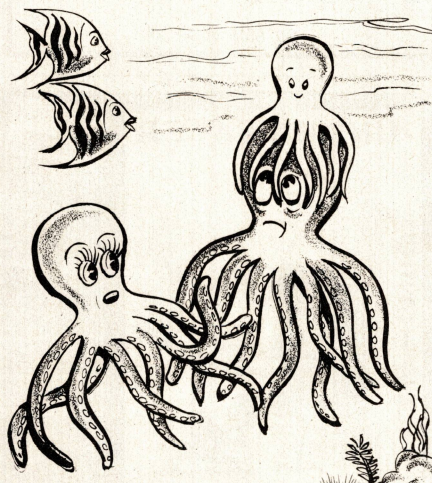
After 25 minutes, the first of the divers exited, with the final buddy team surfacing after 55 minutes. After checking in with the divemasters, everyone headed for the grills for hamburgers, hotdogs, ribs and salad. With a cold refreshment, the divers relaxed in the shade with friends, discussed their dives and enjoyed the food and beauty of the island and sea.

After a hearty feast and a rest, most divers returned to the water's edge for a second dive for the remaining octagons.

After a short time of socializing, New England Divers announced it was time to award the prizes. Everyone gathered up his/her treasure octagons, hoping for a winner. The prizes awarded were donated by Dacor, U.S. Divers, SeaQuest/Mares, Parkway, Harvey's, Oceanic U.S.A., Ocean Dynamics, Wenoka, Ike-lite, Aquacraft, Sherwood, Aquarius, Nor-lantic Enterprises, Dolt, Underwater Kinetics, Darrell Allan, Tekna and PADI. A total of 76 prizes were awarded.

Throughout the remainder of the day, everyone did his/her own thing; some played volleyball, Frisbee, or horse-shoes; others explored the island while some simply enjoyed the relaxing atmosphere. Everyone seemed to return to the grills for more food, including lobsters and watermelon. And, of course, the kegs were never left unattended.

New England Divers Third Annual Treasure Hunt promises to be even bigger: more prizes, more activities, TV coverage, and a grand prize. The date is July 10, 1983; however, attendance is limited so registration well in advance is highly recommended. For complete details contact: New England Divers, 131 Rantoul Street, Beverly, MA 01915; (617) 922-6951. 



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FOR DIVERS

BY FRED BOVE, M.D., PH.D.

This month's column is contributed by Dr. John Knight of Melbourne, Australia, president of the South Pacific Undersea Medical Society (SPUMS). This latter is composed of physicians in Australia and other countries in the South Pacific who are interested or involved in dive medicine. Diving the Great Barrier Reef is an exciting experience, but there are some unique problems which can arise owing to its remoteness and the marine animals found there.

As the wonders of the Great Barrier Reef become better known, more and more Americans are visiting this 1250 mile wonderland. Some of the reef islands have been playgrounds for Australians on vacation for many years. Another way to dive the reef is to join a dive expedition. A number of vessels cater to divers, offering trips of a week or more to the outer reef and the Coral Sea. The third way is to stay ashore in the coastal towns of Townsville and Cairns and travel by fast boat the 25 to 50 miles to the inner side of the outer reef. Of course, the weather has a large say in whether or not one gets in any diving during one's vacation.

For diving accidents, the USA has DAN. Australia has no equivalent to DAN. From the Barrier Reef, the nearest civilian medical facility with a multiman recompression chamber is Prince Henry Hospital in the Sydney suburb of Little Bay. This is 720 miles from Heron Island, 1050 miles from Townsville and 1250 miles from Cairns. The Royal Australian Navy (RAN) has a recompression chamber and a hospital at the naval base, HMAS Penguin, also in Sydney. Expert advice from a trained diving medical officer at the RAN School of Underwater Medicine is available around the clock by calling (Australian) area code 02-960-0333 be-

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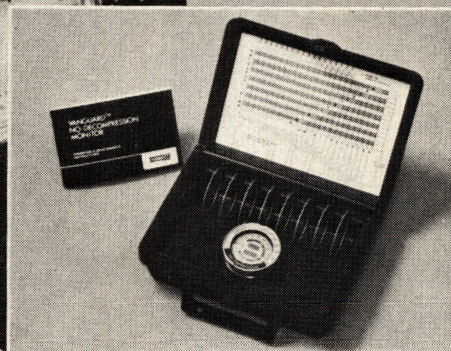


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Rx FOR DIVERS

tween 0800 and 1600 or 02-960-0321 out of office hours and asking for the duty diving medical officer.

The Australian Institute of Marine Science, based near Townsville, has a multi-place recompression chamber. This is some miles from the hospital. There is a team of doctors trained in underwater medicine in the city who rally round to treat dive accidents.

A glance at the map shows the distances involved. It just is not possible to reach a recompression chamber quickly. Even from Heron Island, where helicopters are available, the trip to the nearest chamber (Townsville) takes hours. The longer the delay between the accident and recompression treatment, the worse the results.

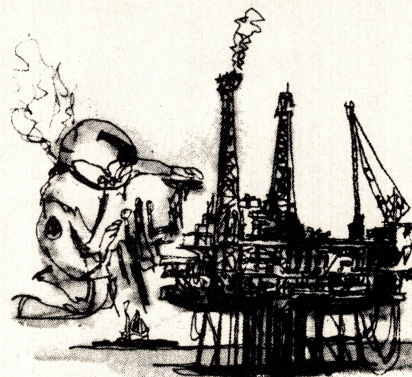
It is the Australian experience that those who develop decompression sickness or air embolism have all failed to observe the normal rules of safe diving. So the sensible diver on the Barrier Reef will take every precaution to avoid a decompression accident. These include having accurate pressure and depth gauges and a watch; never running out of air underwater; reducing the U.S. Navy no-stops limits by 5 minutes below 80 feet, by 10 minutes between 80 to 60 feet and by even more for shallower depths as recommended by Dr. Bruce Bassett of Human Underwater Biology, San Antonio, Texas (see table); making a 5 minute decompression stop at 10 feet on all dives; decompressing for the next depth and time on an any decompression dive; counting the total underwater time, including decompression stops, as bottom time when using the Repetitive Dive Tables; ascending no faster than 60 feet per minute and preferably slower; and, of course, never holding one's breath during ascent.

In the case of a decompression accident at sea, the charter boat skipper will know how to contact Townsville radio and the operator will alert the chamber and medical staff.

Should someone have an accident, the first aid treatment is to give the person 100 percent oxygen; plenty of fluids (unless it is likely that he will need an anaesthetic for injuries); two aspirin tablets; and of course, obtain expert advice on what else to do on the way to the recompression chamber.

The reasons for this advice are:

1. A diver who has decompression sickness or air embolism will have taken up nitrogen during his dive, and will have bubbles in his body and blood. Oxygen breathing gives the highest gradient for nitrogen to leave the body and provides the best chance of overcoming tissue oxygen shortages caused by nitrogen bubbles blocking blood vessels.
2. Divers secrete more urine in the wa-



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ter than they do ashore. This is because both immersion and cold cause a diuresis, the medical word for an increase in urine formation. The water to make this extra urine comes from the blood, so a diver is a bit dehydrated at the end of a dive. If he then develops decompression sickness, he will lose fluid into the tissues and become even more dehydrated. Drinking at least a quart of fluid containing salt and sugar (such as orange juice) an hour, will help restore the blood volume and the circulation to normal.

3. Two aspirin tablets are enough to prevent platelets, the small particles in the blood which come together to start blood clots, from aggregating around the bubbles in the blood. It is much easier for recompression to get rid of bubbles if they are not surrounded by the shell of a blood clot.

For accidents that do not require recompression therapy, the dive shop or dive leader will be able to send you to a physician with a knowledge of dive medicine, who can take care of your sore ears, grazed knees, coral cut legs, etc.

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100	25	20
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120	15	12
130	10	10
140	10	5

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South Pacific Underwater Medicine
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Anyone diving among coral is wise to wear long trousers and a long sleeved shirt. This allows the diver to brush against stinging and prickly creatures and scratchy coral without damage. Wearing shirt and trousers also protects the diver's skin from the sun. Many holidays are spoiled by sunburn.

It is exasperating, to say the least, to travel a long way for a diving holiday, injure your ears on the first dive and have to spend the rest of the holiday out of the water. The trick is to clear your ears before getting into the water, then clear them every two feet on the way down, and whenever you go down two feet during the rest of the dive—a lot of ear clearing, but well worth it to be able to see everything you traveled thousands of miles to see. 🐠



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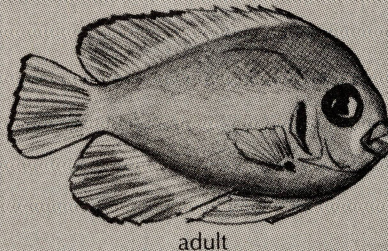
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The Lemonpeel Angelfish

(*Centropyge flavissimus*)

Flavissimus comes from the Latin for yellow and is an appropriate species name for the lemonpeel angelfish—a bright yellow inhabitant of Indo-Pacific reefs. Sometimes simply called lemonpeel, and off Australia, yellow angelfish, this species has been recorded from the coral reefs of Melanesia, Micronesia and Polynesia. It is very rare off the Queensland coast. □ The most distinctive characteristic of the lemonpeel angelfish is the blue ring around the eye. Young males have a large black spot, rimmed with blue, on the side, which is lost with age. There is blue at the edge of the gill cover, and the dorsal, caudal and anal fins are narrowly rimmed with blue. □ Until recently, all small, almost totally yellow angelfishes were called lemonpeels, according to Japanese scientists Yoshio Hiyama and Fujio Yasuda. Then in 1953, another species of almost entirely yellow-colored angelfish was described as *Centropyge heraldi* by Drs. Woods and Schultz. The two fish species can be distinguished on the basis of color. The lemonpeel has the blue ring around the eye, along with the other blue markings, whereas *C. heraldi* lacks the blue markings and has a dark-bordered orange stripe in the anal fin. □ The lemonpeel angelfish is a member of the family Pomacanthidae. Angelfishes were formerly treated together with the butterflyfishes in the family Chaetodontidae, but ichthyologists now prefer to separate the two. Both are among the most beautiful fishes of any tropical



adult

reef, with their bright colors and pancake-thin bodies distinguishing them from all other fishes. One of the chief differences between the two families is the preopercular spine that angelfishes have. This cheek spine is a veritable spike, missing on butterflyfishes. Both angelfishes and butterflyfishes have minute, brush-like teeth, and chaetodont means bristle tooth in reference to this characteristic. □ The diet of the angelfishes is largely comprised of sponges and also includes algae, tunicates and zoantharians such as anemones and corals.

Angelfishes are diurnal, spreading over the reefs to feed by day and entering a sleepy state, or torpor, by night at which time they often exhibit color changes. □ Within the Pomacanthidae, the major genera are *Holacanthus*, *Pomacanthus* and *Centropyge*. Among

these, the *Centropyge* has the species of the smallest sizes. These fishes grow to three or four inches maximum, as compared to the average 12-14 inches for those of the other genera. The lemonpeel angelfish reaches a maximum size of four inches. □ Juvenile angelfishes are prized by aquarists the world over, and most of them change markedly as they grow. In the *Centropyge*, however, adult and juvenile do not vary much in color pattern. In the lemonpeel angelfish, the dark, blue-ringed spot on the side of the fish is all that disappears with age and this spot is said to remain for a longer time as the fish matures if the fish is in good condition. ~~✂~~

Photo By Alex Kerstitch-Text By Hillary Hauser

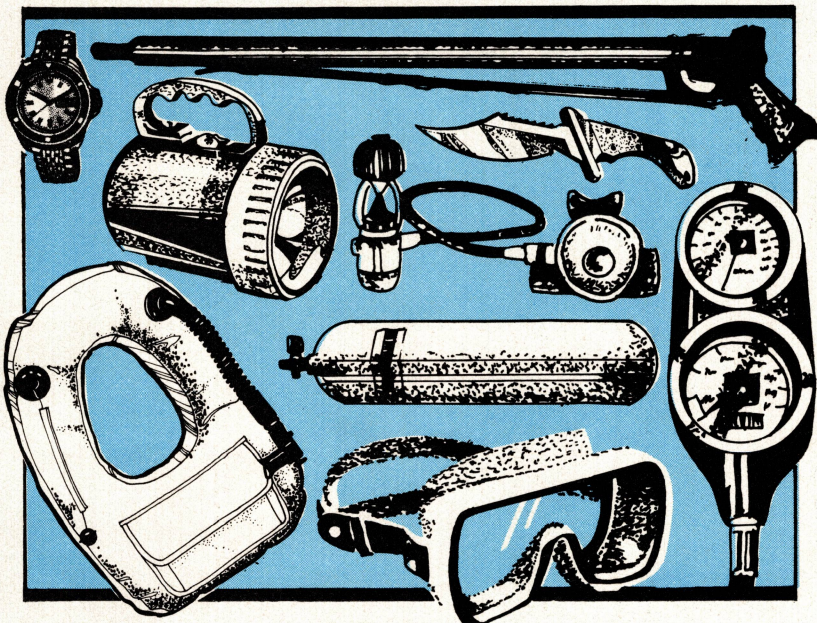
Kerstitch took the photo in 35 feet of water off Malekula, Vanuatu. He used a Canon F1 with 55 mm macro lens in an Ikelite housing, Subsea Mark 150 strobe. Kodachrome 64 at f16, 1/60 second, 18-20 inches from subject.



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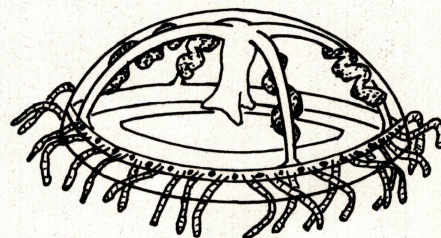
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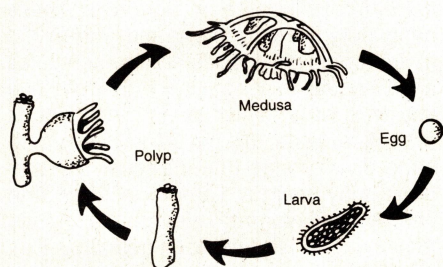
Fifteen feet under the surface of De-Gray lake near Arkadelphia, Arkansas, everything is colored a brownish green. Lazily I glide over the bottom with my buddy sightseeing to my right. Curiously eyeing us, a bass wiggles toward us. I reach out to pet him, and he disappears in a glittering flash. Everything seems so peaceful. The bream gather in senatorial groups—seeming to be discussing the problems of the world. It is a freshwater dreamland. Then, right before my eyes, from the dimness of the distance, materializes a jellyfish! Miniature and mindless, this bluish white underwater parachute is about the size of a dime—and out of place. But my buddy confirms the sighting. The bell is almost clear with the tentacles hanging down like short lengths of thread. A freshwater jellyfish! What will they think of next?

The freshwater jellyfish is given the unbelievable name *Craspedacusta* by biologists. The most common species is *Craspedacusta sowerbyi*. Like saltwater jellyfish it is a coelenterate, but unlike many of its saltwater cousins it is in the class Hydrozoa (the more familiar saltwater types are class Scyphozoa).

Craspedacusta has two life forms, a

medusa, or jellyfish-like stage, and a polyp (anemone-like) stage. In the beginning of its life cycle, it is a polyp. The body is a cylindrical stalk. The polyp of *Craspedacusta* is very small (2 mm long) and has no tentacles—the nematocysts (or stinging cells) are around the mouth. These cells have tiny whip-like structures coiled tightly inside them. The whip is usually barbed and hollowed. When a tiny animal contacts the nematocyst, this whip shoots out, penetrates the animal's skin, (or exoskeleton, or whatever) and sticks in it. It then serves a dual purpose: 1) The hollowness lets it act like a hypodermic needle while a small amount of paralyzing chemical is pushed into the animal's body, and 2) It is like a harpoon, drawing the prey into reach of the mouth. Most coelenterates have no effect on man. (The exceptions are the Portuguese man-of-war, certain scyphozoan jellyfish and certain corals. These animals' chemical is irritating or toxic to man.)

The polyp stage of *Craspedacusta* is hard to find, and for many years the relationship between it and the medusa (jellyfish-like) stage was not known. At that



time it was thought to be a different species and named *Microhydra ryderi* by Edward Potts. However, because of biologists' rules of naming (law of priority), the correct genus name is *Craspedacusta*. The polyp stage is often referred to as a microhydra. The microhydra is usually found sticking to submerged objects over which it moves slowly. It can be found at various depths, and sometimes it floats suspended from the surface film or even drifting with plankton.

Strange as it may sound, baby freshwater jellyfish do not come from the cabbage patch. A microhydra can reproduce in any of three ways. One way is budding: A bulge forms on the side of a polyp. This continues to grow until a new individual is growing right out of the side of the first. When it reaches a certain size, it pinches off. When the microhydra of *Craspedacusta* forms buds, the bud usually remains attached, forming a colony of two or three (or more) individuals.

Another way to reproduce is when the microhydra breaks off little lumps which form free swimming larvae which eventually settle down as microhydras.

Its third method of reproduction is to break off a group of cells at the top which

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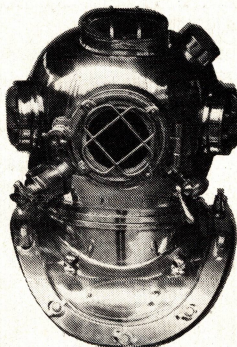
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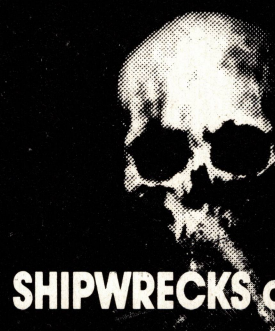


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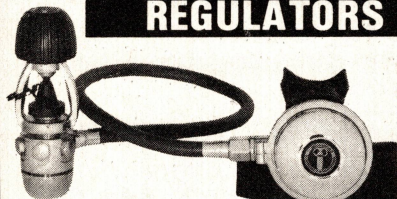
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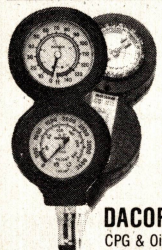
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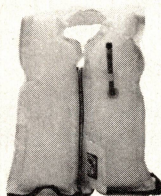
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FRESHWATER JELLYFISH

have formed a cup shape. These cells then turn upside down and become freshwater jellyfish. The microhydra stage has no sexes; all reproduction here is asexual. The medusa stage, however, does have separate sexes and the medusae travel in groups of the same sex. (This may be owing to environmental factors.) When the opposite sexes of the medusae get together, they give birth to tiny, free-swimming animals (larvae) that soon settle down on the bottom to become microhydrae. Thus, freshwater jellyfish give birth to other freshwater jellyfish. In biological parley, this is known as "alternation of generations."

The medusa stage of *Craspedacusta* looks much like a saltwater jellyfish, except it is very small. The part that looks like a parachute is called the umbrella. From underneath the umbrella hangs a long tube called the manubrium which ends with the mouth. The tentacles are very numerous and are arranged around the umbrella in three or more sets. These hang downward to sting and entrap the microscopic life it feeds on. The tentacles are unequal in length and do not have any type of adhesive pads. The gonads or sex organs are large sacks which hang down inside the umbrella. The umbrella may attain a diameter of 2 cm and can be any color from clear to bluish gray to straw. The jellyfish don't actually swim, but are carried around by currents. However, they are capable of limited movement by rapidly closing the umbrella, forcing the water out from under it—something like a jet. Primarily this is used for vertical movement.

The hunt is on! *Craspedacusta* jets up a few centimeters, then spreads its umbrella and slowly floats down.

Unwarily a water flea, *Daphnia*, wanders under the sinking umbrella. At the first touch, the nematocysts spear it, the tentacles grasp it, and the umbrella surrounds it. *Voila!* Lunch.

The freshwater jellyfish may have evolved from marine ancestors in rivers. It was first found in the Regent's Parks Gardens, London, England in 1880. In the United States it was once considered rare and any new sighting was immediately reported. It is not as rare as once thought, but still it is not a common sight. Millions of medusae were sighted in September 1917, in Benson Creek, Kentucky. They were sighted again in 1924. But, in the years before and between, none was found there.

Back in Lake DeGray, my buddy and I wave goodbye to our freshwater jellyfish as it slowly drifts off into the dimness. After seeing a jellyfish, I'd just like to say that I surely am glad *Jaws* doesn't have any cousins in our neck of the woods.

NEW HAWAIIAN REEF

(Continued from Page 71)

pumping water into the derelict *Mahi*, which stubbornly remained afloat. Finally, as if tired of the game, she gave in and began to go down. And, then she went down like a rock: So quickly, in fact, that two men who were still onboard throwing off tools and supplies used on the job had to jump for their lives as the middle went under. The bow raised briefly for a moment, as if to take one last look at the world it had known for so long, then plunged in the swirling turquoise waters to dig her niche 90 feet below.

At the moment that the *Mahi* died, Hawaii's largest artificial reef was born. The rusting hulk which had appeared an ugly eyesore above water was transformed into a majestic part of the reef, towering many feet above the surrounding underwater terrain.

Within a month of its birth, the artificial reef began growing. A ship provides an endless selection of nooks and crannies which are favorites of reef dwellers. Sunken wrecks, in fact, often support more marine life than the surrounding natural reef. It appears that the *Mahi* will be no exception, as fish, eels and other bottom dwellers have shown considerable curiosity, many already moving in to take up permanent residence. Colorful encrusting corals, sponges and other sedentary life forms take longer to develop, but have already begun making their appearance. The ship is becoming a center for reef activity, and divers have seen turtles and rays in flight.

Knowing that the *Mahi* would help the marine environment as well as sport and commercial fishing was only a part of the reason which spurred Ken Taylor and volunteers to spend the long time and hard work necessary to make the dream of a huge artificial reef become a reality. Part of their enthusiasm was to give Hawaiian and visiting divers a great wreck to explore. Many local divers and biologists are making photo records, as well as fish counts of the marine growth on the wreck in the hopes that it will encourage the state to do other, similar projects. The *Mahi* has indeed found a fitting end.

RIVER DIVING

(Continued from Page 47)

choice diving spots, some time and effort will be involved. Contacting dive shops in the local area is a good way to start, especially if you are interested in recovering fossils. If manmade relics are what you are after, then several hours spent in a library studying old maps for locations of ferry sites and plantations would be well worth the time.

A dive in a South Carolina river is truly a dive into history!

Phone Central Last!

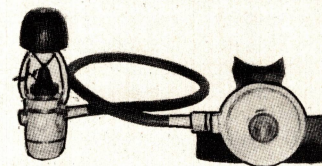
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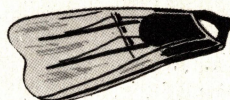
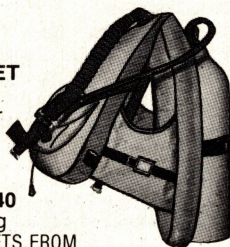
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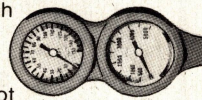
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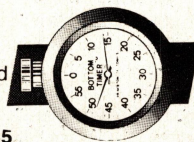
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Cayman

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Cayman Brac

Brac Reef Hotel

Now, direct flights from Miami make the Brac's wall diving even more accessible. The Brac Reef is the islands most modern hotel, featuring 30 ocean-front rooms, pool, tennis, sailing and fine restaurant. Winston Mc Dermott's Brac Aquatics offers unlimited diving, plus a trip to Little Cayman.

Roatan

Anthony's Key Resort

Roatan, one of the Bay Islands of Honduras, is a tropical paradise reminiscent of an earlier Caribbean era. Anthony's Key, looking more like an island plantation than a resort, provides cottages with comfort, privacy and delightful view. Virgin blue water from the Gulf-stream trench, two miles deep, is propelled over the 30-mile barrier reef, and proves the ideal location for Peter Hughes' DIVE ROATAN.

Bahamas

South Ocean Beach

Located only a few miles outside the hustle and bustle of Nassau on the south shore, this top-rated resort faces Bahamas 4000 meter deep Tongue of the Ocean, with a wall that starts at less than 45 feet. The hotel amenities are superb, including dining, tennis, wind surfing, sailing and championship golf course.

Cayman

London House

What better way to spend a Grand Cayman dive vacation than in a handsomely designed resort apartment with every convenience - two bedrooms/baths, kitchen & living room, facing the ocean - ideal for diving couples and families. Located on Seven Mile Beach, this package features superb Cayman diving with Bob Soto. Roundtrip airfare included in the low season rate.

Cozumel

La Ceiba Beach Hotel

Cozumel's favorite dive hotel and resort, combined with Fantasia Divers, make this the best diving package on the island. Paradise Reef, just offshore, and Palancar Reef, only twenty minutes away offer breathtaking beauty. Beach-front accommodations, pool, unlimited beach diving and choice of restaurant.

Turks & Caicos

Hotel Kittina

The most spectacular dives in Grand Turk involve the 7000-foot drop-off paralleling the leeward shore. Located on this truly unexploited island, the Kittina offers 22 spacious rooms on the beach and features Mike Spillar's Turks Island Divers with a 32' flattop and full service dive facility.

Bonaire

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This popular resort captures the mood of Bonaire. Your own private cottage is just steps away from Captain Don's new dive center in front of one of Bonaire's most popular reefs. Complete certification course and U/W photography facility. Good food, good friends and unlimited diving.

Cayman

Royal Palms & Coral Caymanian

The Pick of Cayman! Skin Diver says "these hotels are right on the beach and are perfectly suited for sunbathing, swimming, sailing, snorkeling and of course, scuba." Located in the heart of seven mile beach, Don Foster's DIVE GRAND CAYMAN offers personalized service. Roundtrip airfare from Miami included in this special package.

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Key Largo's Pennekamp Park... more than 40 species of coral, 650 varieties of tropical fish, and your own luxury two bedroom villa... complete diving package with Joe Clark's Ocean Divers. Resort and certification courses, plus underwater photography with Stephen Frink.

Turks & Caicos

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Your dive vacation is keyed to formal relaxation on the private island of Pine Cay, with beach front suites, freshwater pool, excellent cuisine and impeccable service. The dive operation is personalized and just minutes from shore you'll discover exhilarating drop-offs, blue holes, virgin reefs, caves and canyons.

Bonaire

Flamingo Beach Hotel

This 110-room resort hotel, a few minutes from the airport, a short stroll to town is the home of Peter Hughes' DIVE BONAIRE. More than 40 dive sites, plus Bonaire's incredible beach diving. Underwater photo course and developing. Afterwards, relax in the freshwater pool or jacuzzi.

Cayman

Spanish Cove Resort

A Caribbean diver's paradise that's in a class by itself is the only way to describe this fabulous resort. Just minutes from George Town and Seven Mile Beach, you are treated to world-class diving on the North Wall. State-of-the-art dive center, photography and instruction make this the best that Cayman has to offer.

Jamaica

Jamaica Hilton

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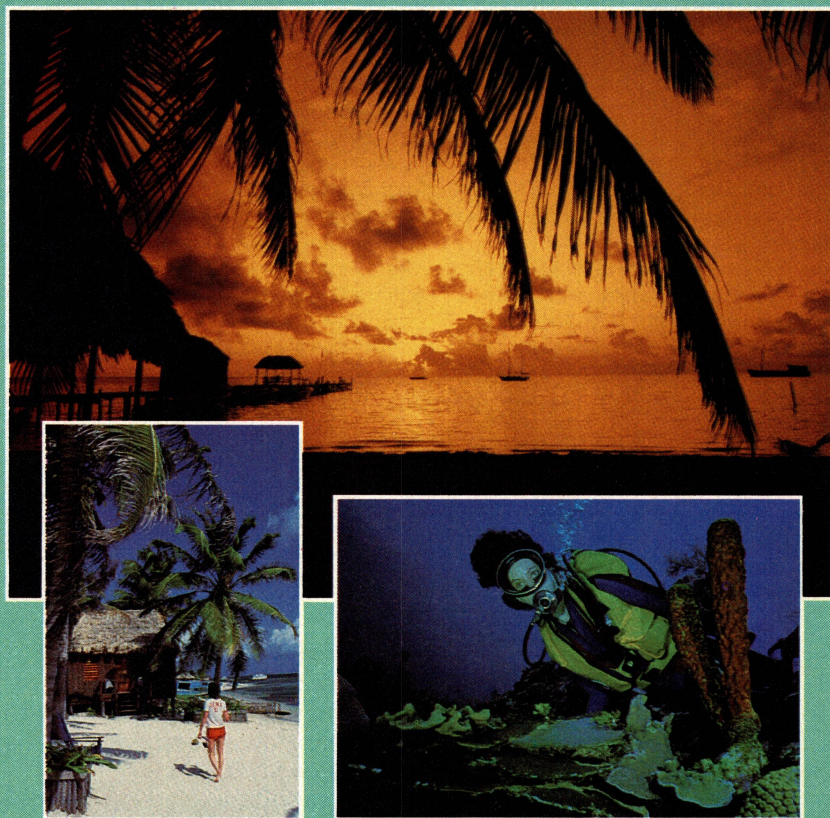
AMBERGRIS CAY

In Beautiful Belize

TEXT AND PHOTOGRAPHY
BY DENNIS GRAVER

I waved excitedly, trying to catch the attention of Barb, my buddy, wife and model. In a cut about 50 feet ahead, I could see the back of a large fish—a huge fish—behind the wall of the channel nearest me. The creature was motionless. Finally, Barb looked my way. I pointed, and we started swimming closer in hopes of photographing such a grand animal. As the distance between us and the fish decreased, my excitement heightened. A large eye stared at me, and the jewfish—I could now determine the species—cocked himself slightly to one side as if trying to get a better view. I was within six feet of my quarry, but he was slightly below me. I was hoping to ease into the cut in front of him, gain an upward angle, and start taking pictures. The big fellow started moving slowly, but moving, and thwarted my plans. I followed him for a short distance as he slowly followed the cut into deeper water. What a brute! I love encounters with large animals underwater. I was disappointed that I didn't get the pictures I had hoped for, but that was about the only disappointment of our stay in Belize, the hospitable, Central American country formerly known as British Honduras.

Bordered by Mexico on the north and Guatemala on the west and south, Belize is sub-tropical, underpopulated and very picturesque. Its principal attraction, however, from a diving point of view, is its barrier reef—the longest in the Western Hemisphere. Parallel-



ing the coast of a delightful country where British influence is still apparent and English is the official language, the barrier reef offers some of the finest underwater experiences available to the traveling diver. This spectacular reef lies only a few hundred yards offshore Ambergris Cay, an island 25 miles in length situated 10 miles off the coast of Belize. This is where our dive group, headed by Gary Geiger, a master instructor from St. Louis, Missouri, logged dives and memories for a week.

My wife and I flew from California to New Orleans and met Gary, a long-time friend, and six others who were

escaping from winter in the Midwest. From New Orleans, we departed for Belize City via Sasha Airlines, whose service was quite good both going and returning. Customs and immigration in Belize were simple and efficient. The 36 miles from Belize City to Ambergris Cay were negotiated pleasantly in modern 12 seater planes operated as a private service on Ambergris Cay.

San Pedro, a picturesque fishing village with a population of 1700 and quaint shops, is the center of civilization on Ambergris Cay. Several dive operations can be found in it and on its outskirts. We stayed at Ramon's

BEAUTIFUL BELIZE

Reef Resort, a beautiful island hideaway about a five minute walk along the coral sand beach from San Pedro. Palm shaded thatched-roof cabanas, gentle sea breezes, superb island meals, and an excellent dive operation made Ramon's Resort rate very highly with me and with everyone in our group.

Barrier reef diving is different. The water inside the reef is very shallow and quite calm. Unfortunately, there are few places to snorkel or dive between the reef and the island. Except for a couple of sites accessible only by boat, there is little for divers to see in the shallows. However, the canyons, cuts, pinnacles, tunnels, coral caves, and other superb formations outside the reef more than compensate for anything missing on the sheltered side.

During our stay, the water visibility ranged from 70 to over 150 feet. The water temperature was 82°F and there were no currents. I was told these are the usual conditions.

Since the reef is on the open ocean side of the island, swells and surface chop are the rule rather than the exception. All the surface commotion goes unnoticed at 60 to 80 feet beneath the surface—the usual depth for dives in the

area. The abundance of life, coupled with the outstanding coral formations, make one quickly forget a couple of minutes of rocking in the boat until the anchor has been set. The water movement on the ocean side of the barrier reef isn't terrible, but it is usually enough to make final preparations for a dive difficult. Because of this and the fact that the water is extremely calm inside the reef, it is standard procedure to stop the boat within the protection of the natural barrier and adjacent to a dive site to suit up fully for a dive. The guide then navigates the boat through a break in the reef, anchors the vessel about 300 yards beyond, and gets everyone into the water quickly. The procedure works quite well.

Whenever I reflect upon various places I have dived, visual impressions are projected onto a screen in my mind. The images recalled from the wonderful times spent underwater in Belize include the fantastic cuts and coral canyons, the abundance of life, and the colorful sponges. Sharks, leopard rays, giant fish, and big turtles are common sights. Migrating along 175 miles of unspoiled reef, large and magnificent creatures are encountered quite frequently even at the reef's most popular diving locations. With hundreds of feet of nutrient rich water immediately adjacent, the sponges of the barrier reef thrive. Shot after shot of brilliant, nearly fluorescent color was etched onto film as I photographed sponges

backed by deep blue, crystal clear water. And I was tempted to take many more photos of the beautiful sponges.

One particularly interesting episode occurred when one of our divers discovered a nine foot nurse shark sleeping in a crevice. Responding to obviously enthusiastic long range signals, I swam rapidly to the area and immediately spied the shark. I settled into the crevice in front of the animal and started taking pictures. Gary Geiger took up a position at the other end of the shark and provided some perspective. The huge animal became restless and lifted its head several times, providing some fine angles for photos. Surrounded by large, one-eyed, bubble-blowing creatures, the shark probably thought it was having a nightmare. Suddenly, with several powerful thrusts of its tail, the large beast, with two remoras attached, surged out of the crevice, turned hard in front of me, and glided over the top of the reef into the blue. I can still see the ripples in his side as he accelerated, and I can still feel the respect for the strength he displayed upon deciding to make an exodus.

Turtle riding was another thrill shared by our divers. A big hawksbill provides enough excitement in a few moments to make an entire dive a special experience. The divers in our group were especially pleased that these memorable moments could be captured on film, and I was glad to have such great photo opportunities.

Even the Fish are Friendly in the Caymans.

And they are not far away.

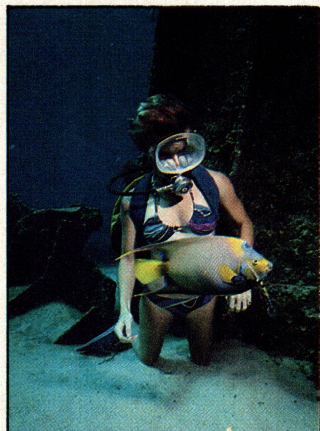
What makes the Caymans different from all other dive locations in the world—they rank among the top three—is the incredible number and variety of closeby dive sites. For both beginners and experienced divers.

SKIN DIVER MAGAZINE calls the Caymans "The Superbowl of Scuba—the main event of dive adventure. There is no place in the world quite like them."

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CAYMAN ISLANDS

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Not being fond of long boat rides, I was pleased to find a number of excellent places to dive within a few minutes of our resort. Tres Cocos, Tuffy Reef, Punta Arenas and Outer Hole Chan are just a few of the locations which can be reached very quickly from Ramon's Reef Resort. Unusual dives, including a 1000 foot diameter Blue Hole, are available in the area for those who don't mind putting in some extra travel time.

Ambergris Cay offers more than just diving. Shopping for Ziracote wood carvings, turtle and black coral jewelry, and mahogany or teak furniture is a must. A trip to the Tortilla Factory is also enjoyable. Game fishing is excellent, sailing is available, and glassbottom boat trips can provide an underwater window for non-divers. Trips to the Altun Ha ruins on the mainland can also be arranged. Local island dances spice up the weekend night life. And, of course, lazing in the tropical sun has to be one of the main attractions.

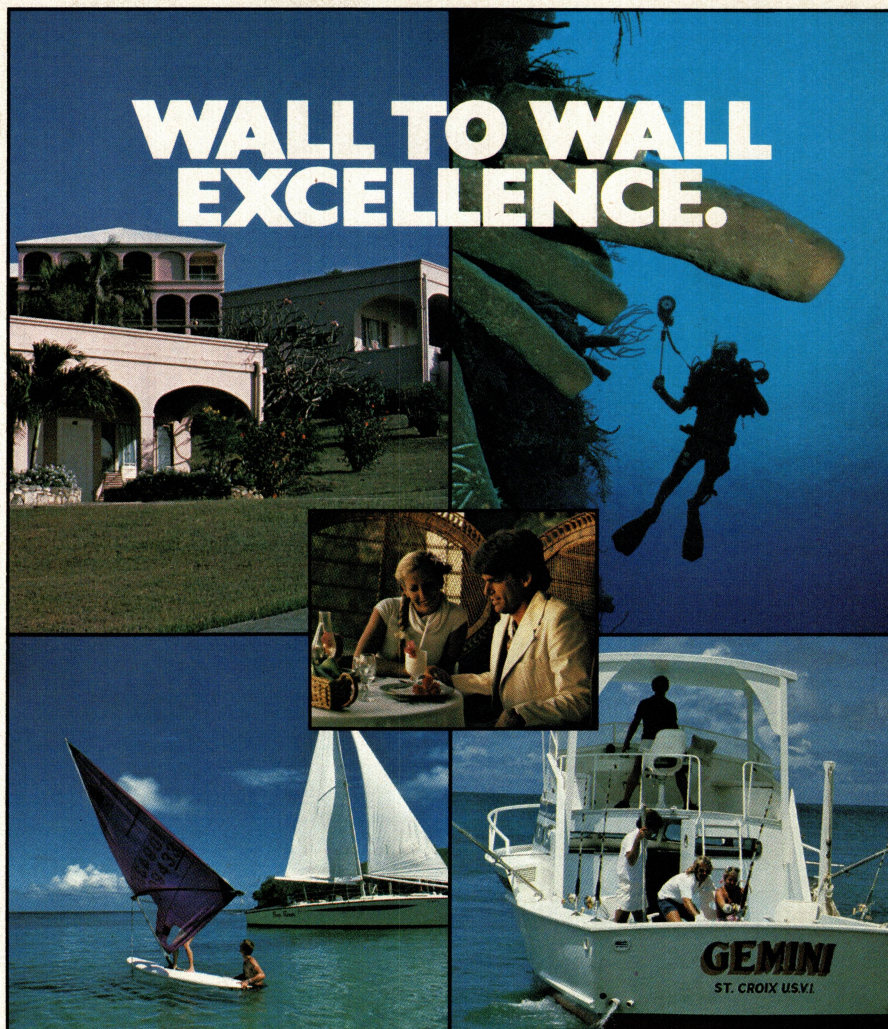
Ramon's Reef Resort can certainly be recommended. We feasted family style on delicious island cuisine served from a fixed, but scrumptious, menu. The resort is equipped and prepared to accommodate up to 80 people. Ramon Nunez, the manager, has been a divemaster and resort operator in Belize for 14 years; and handles the operation on the cay very well. His operation includes a well-equipped dive shop, three islander boats, and an excellent air system. There are no problems with water at Ramon's. He told us the tap water was safe to drink, and he was correct. No problems resulted.

If you are planning to experience barrier reef diving, any time of year is fine except October and November, which are the rainy months. December and January are usually the best months for diving. Flights depart to Belize City daily from Miami and New Orleans via Sasha, Air Florida or Taca Airlines. Several flights a week are also available from Houston. U.S. proof of citizenship is required. A passport is recommended, but a certified copy of a birth certificate will suffice. No inoculations are required. Gary Geiger can help with information or reservations for travel and for bookings at Ramon's. Gary can be contacted at 10132 Buffton Drive, St. Louis, MO 63123; phone (314) 638-9304. If you have never had the opportunity to visit Ambergris Cay and dive the incredible cuts and canyons of the vast barrier reef, then, as they say, "You better Belize it!"

BAHAMAS DIVING BROCHURE

The new spring/summer diving brochure detailing scuba packages to the Bahamas is now available through Aqua Adventures.

Aqua Adventures has moved its national offices to new and enlarged quarters in New York. The new address is Aqua Adventures, Inc., 321 Fifth Avenue, New York, NY 10016.



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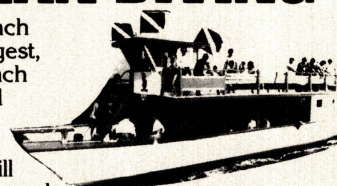
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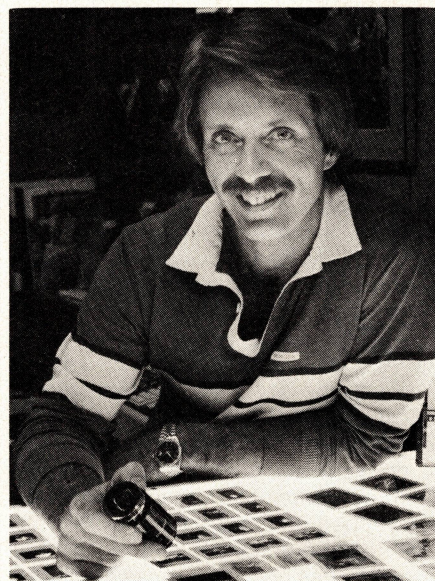


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In conjunction with Sea Sports Travel, U/W photographer Stephen Frink has chartered the newly constructed 65 foot catamaran, *Reef Seeker* to explore the



Great Barrier Reef and Coral Sea. While the boat will sleep 24 people, the photo-tour will be limited to 18 to maximize individual comfort. The tour will depart from Townsville, Australia on November 12 and return on November 22.

Additional information is available from Stephen Frink Photo, P.O. Box 19A, Key Largo, FL 33037 or call Sea Sports at (713) 353-8466.

REEF ECOLOGY PROGRAM

The fourth annual Bahamas Coral Reef Ecology Program will be conducted July 18-30 at the Florida Institute of Technology (FIT) in Melbourne, Florida and the Underwater Explorers Society (UNEXSO) in Freeport, Grand Bahama Island.

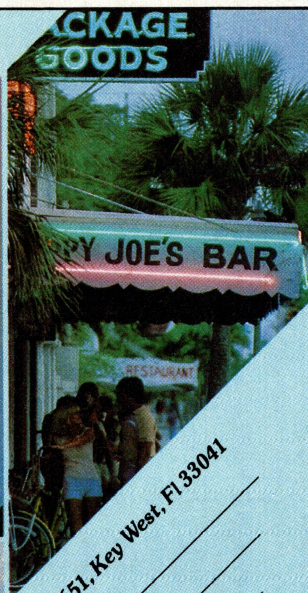
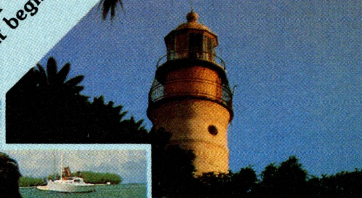
"The program is designed primarily for science teachers," said Dr. Robert H. Fronk, head of the Science Education Department at FIT and director of the Coral Reef Ecology Program. "But anyone who is interested in reef ecology may apply," he added.

The program consists of five days at the university studying various aspects of reef ecology, from the biology of coral polyps to fish identification. The remaining time is spent scuba diving on the reef off Grand Bahama Island with UNEXSO. Non-divers may take UNEXSO's three hour introductory scuba course which qualifies them to dive under supervision.

Information concerning fees and accommodations may be obtained by contacting Dr. Robert H. Fronk, Florida Institute of Technology, University Blvd., Melbourne, FL 32901, or Lou Fead, UNEXSO, P.O. Box 2433, Freeport, Grand Bahama Island.

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Brochure and 'treasure map', Box 4651, Key West, FL 33041

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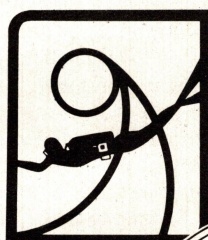
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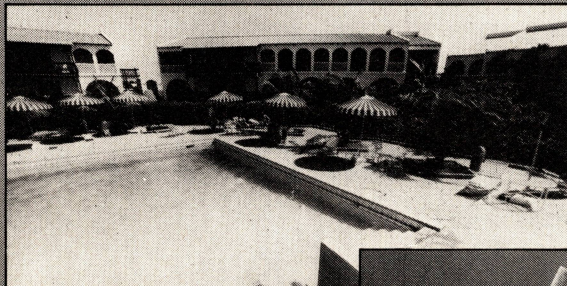
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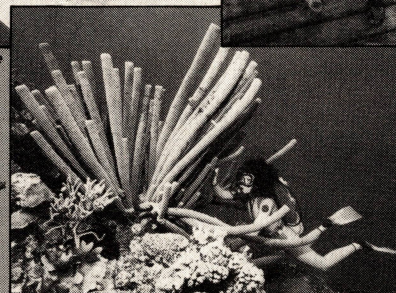
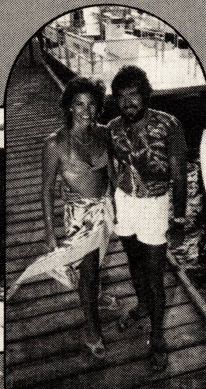
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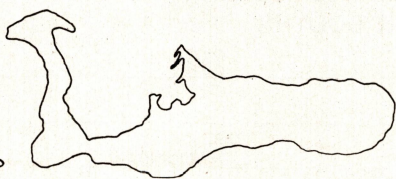
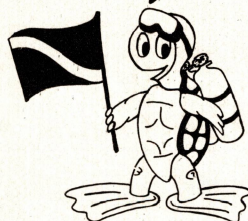
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DIVE AUSTRALIA SHOWS

This year David Loughnan, president of Dive in Australia, is traveling throughout the U.S. with a special show on Australia



photos/Geri Murphy

diving. Included in the show are two of Stan Waterman's latest films, *Roughing It in the Coral Sea* and *Day of the Whales*. *Roughing It* is Waterman's 63rd film, shot aboard the \$3 million luxury sailing yacht, *Scotch Mist II*. Shown along with the Waterman films is Loughnan's humorous slide presentation featuring all Australian dive resorts and six dive boats: *Reef Seeker*, *Bali Hai*, *Reef Explorer*, *Mantaray*, *Tafua* and *Scheherazade*.

A list of Dive Australia show dates appears below:

June 7—Palace of Fine Arts Theatre
3301 Lyon Street
San Francisco, CA 94123

June 10—The Ambassador Garden Hotel
3400 Wilshire Blvd.
Los Angeles, CA 90010

June 12—Sheraton Newport Hotel
4545 Mac Arthur Blvd.
Newport Beach, CA 92660

June 13—Registry Resort
7171 N.Scottsdale Road
Scottsdale, AZ 85253

June 14—Denver Hilton Hotel
1550 Court Place
Denver, CO 80202

June 15—Franklin Institute Science Museum Lecture Hall
20th & The Parkway
Philadelphia, PA 19103

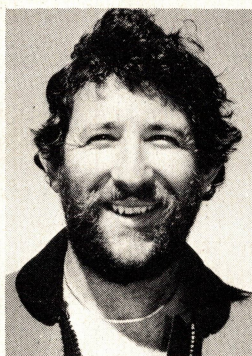
June 17—Sheraton Centre
811 7th Avenue
New York City, NY 10014

July 8—Tampa Marriott Hotel-Airport
Tampa International Airport
Tampa, FL 33623

July 9—Holiday Inn-Downtown
175 Piedmont Ave., N.E.
Atlanta, GA 30303

Show attendees are invited to register for a special grand prize to be awarded at the end of Loughnan's tour—a Tekna DV. This little diver propulsion vehicle is 20 inches long, weighs 38 pounds, has a range of approximately three miles and can travel as deep as 300 feet.

David Loughnan lives in Sydney, Australia and has been diving six years. Nothing about him is ordinary, not even the way he got into diving. The way Loughnan tells it, he was on his way to dinner with a lady friend when an argument erupted. As the discussion got more heated, the dinner plans were aborted and the decision made to send the lady home in a cab. They stopped at the nearest phone, which just happened to be in a dive shop. A cab was called and by the time the lady had departed, David had signed up for scuba lessons.



He was immediately hooked on the sport and has since dived the Great Barrier Reef, Coral Sea, New Zealand, Fiji, Bonaire, the Bahamas, and Cayman.

For more information on the Australia dive shows contact: Toni Gliem Eddy, Dive in Australia, 680 Beach Street, Suite 498, San Francisco, California 94109 or call (415) 928-4488.

RIDING ROCK PHOTO PRO

Island Divers, Ltd. and Riding Rock Inn Resort of San Salvador, Bahamas have appointed Dan Batchelder resident photography pro, responsible for the Underwater Photo Center. Daily E-6 film processing, equipment rentals and limited repairs, one and two day courses with periodic specialty advanced week-long photo programs are offered.

For further information contact: AT Reef Ventures, 292 S.W. 34th Street, Ft. Lauderdale, Florida, 33315.

CAYMAN AQUATIC CLINIC

The Aquatic Development Clinic is leading one week trips to Grand Cayman through October. The clinic trains non-swimmers and aquaphobics to snorkel and scuba dive over a 10 week period prior to departure. Certified scuba instructors teach and supervise.

For information, call (206) BE-A-FISH, or write Aquatic Development Clinic, 11009 1st Ave. So., Seattle, WA 98168.

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CAYMAN WITH WHEELS

Right in the heart of Grand Cayman's Seven Mile Beach is Paradise Manor, a condominium complex comprised of 96 self-contained two and three bedroom units. And, dive packages are now available at these condo units complete with a Toyota Starlet from Budget.

In addition to the car, packages include two, one tank morning boat dives daily, one night dive per stay, unlimited shore diving, a Bob Soto's T-shirt and air-conditioned accommodations at Paradise Manor. Packages range from three to seven nights for two to six divers per unit.

For complete details on this package, write Caribbean Hotel Management, 5920 Rodman Street, Hollywood, Florida 33023.

SCARR TO CORAL SEA

La Mer Diving Seafari is offering a Touch The Sea trip to Australia, featuring Dee Scarr.

Scarr currently runs the Touch The Sea program on Bonaire. She is a photo/journalist and PADI scuba and specialty instructor as well as a dive guide.

The Touch The Sea trip will take place October 6-23 on the 79 foot *Coralita*.

For more information about the La Mer/Touch The Sea voyage to Australia, contact: La Mer Diving Seafari, Inc., 823 UN Plaza, Suite 810, New York, NY 10017.

CHARGE WITH OCEANQUEST

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REEF HOUSE MANAGERS

Reef House Resort in Roatan has hired Leah Riley and Jon Way to manage all operations.

Both Riley and Way bring extensive dive backgrounds to the resort. Both are PADI open water instructors as well as instructors in CPR and water safety.

The resort has recently expanded its occupancy from 26 to 30 persons with the addition of a duplex, which can comfortably handle families.

Scuba Easy Check the DIVERS DIRECTORY in the back of this magazine

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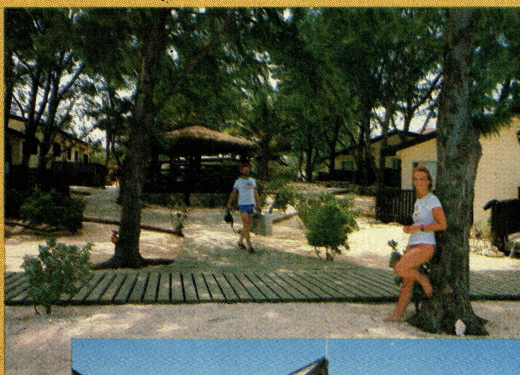
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TEXT AND PHOTOGRAPHY
BY STEPHEN FRINK

Caribbean dive tourism is a major growth industry, but the resorts enjoying the highest occupancy levels and most consistent repeat traffic are those with an awareness of the demands of today's consumer. The traveling diver is increasingly sophisticated regarding the basic amenities and services expected of a resort. Spanish Cove Resort on Grand Cayman is able to fulfill those expectations and more.

A short historical perspective is appropriate to appreciate the commitment which generated the transformation of the property formerly known as Spanish Bay Reef into Spanish Cove. The property itself has always been impressive: On Grand Cayman's northern ironshore, the famous North Wall is only minutes away. There is a beautiful shallow reef just off the beach and the popular Seven Mile Beach area is a short boat ride away. When the weather is behaving, as is most often the case on Grand Cayman, spectacular diving is available in the immediate proximity of the resort. When the winds do pick up, sheltered anchorages and dive spots are easily accessible on either the west or east side of the island. Consequently, very few dive days are ever lost to weather. For these reasons Spanish Bay Reef enjoyed an enthusiastic following among the dive community.

However, certain aspects of the operation were difficult for both guests and staff. The primary problem was geographic, specifically the ironshore which prevented driving flattop boats onto the



photo/Geri Murphy



photos/Geri Murphy



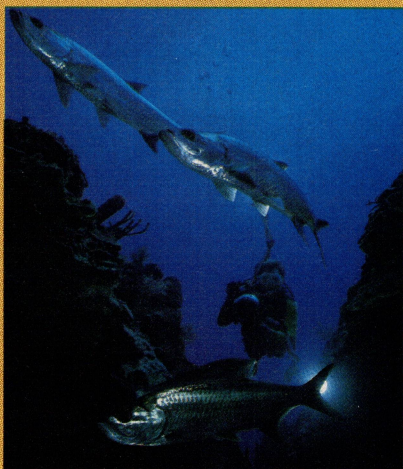
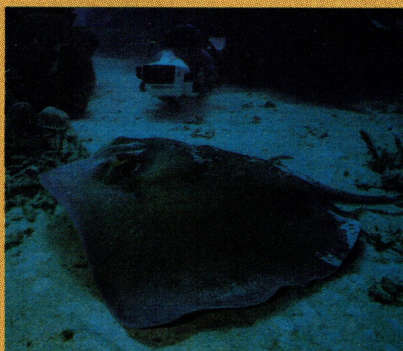
Spanish Cove Resort on Grand Cayman has 21 rooms and the entire facility has recently been remodeled and upgraded. An efficient dive shop has been added, as well as a photo center featuring an underwater video camera. Dive boats provide easy access to exciting walls and wrecks along the Grand Cayman coast.

shore to pick up the divers. As a result, both guests and divemasters had to wade to and from the boats carrying scuba gear and cameras. Ultimately the property came to the attention of John McMillian, the purchase negotiated and the tasteful evolution into today's Spanish Cove begun.

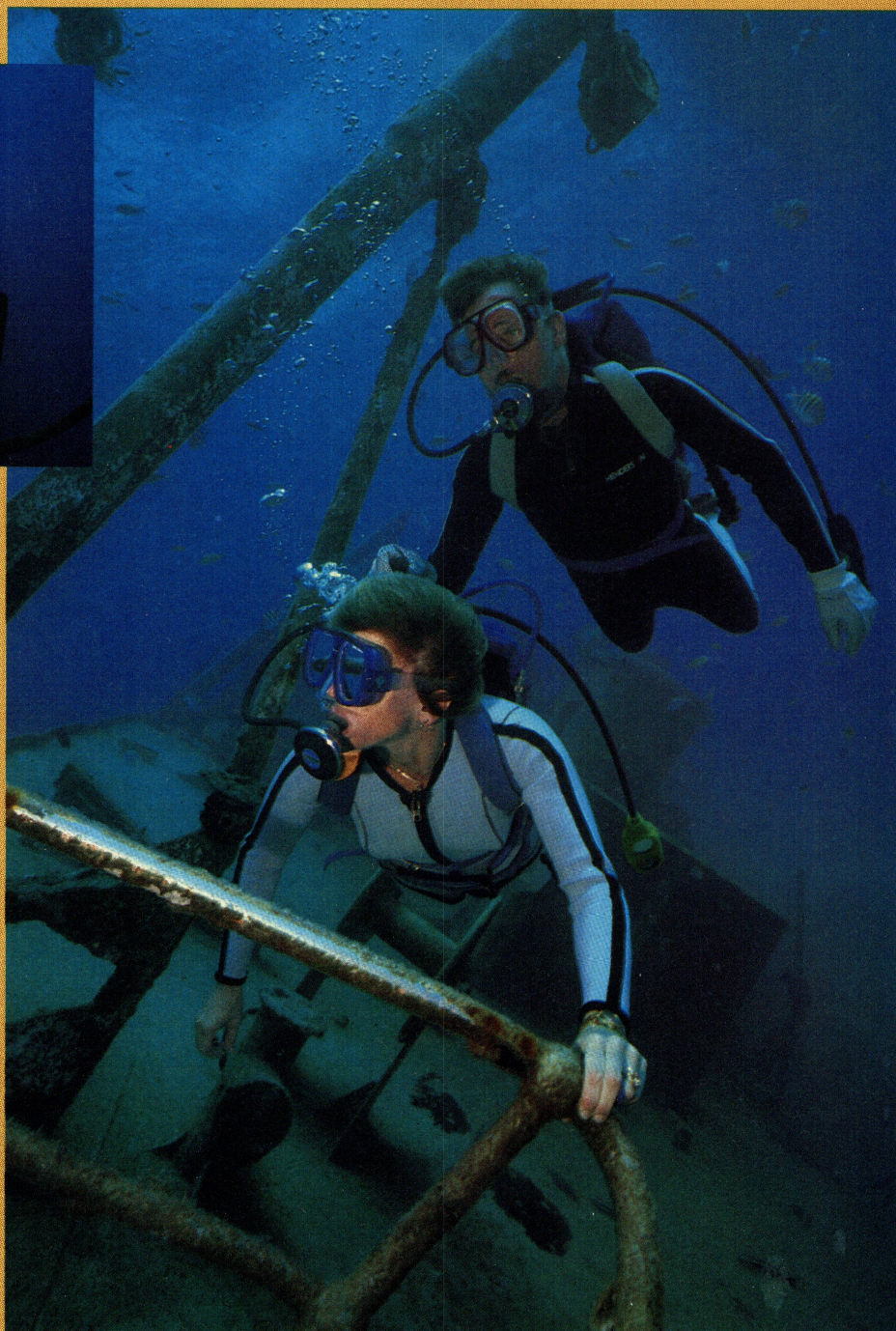
McMillian's primary business interests are in the energy industry and as a result he began diving in the early 1960s, in rather remote areas of the world, for oil exploration. This naturally led to an interest in sport diving and fairly extensive travel. The one problem he noticed consistently, at the time, was that there were

relatively few dive destinations where a diver could go with a family and experience comfortable accommodations, good food and drink and reliably high quality diving. Grand Cayman offered the good diving, combined with friendly people and a benevolent tax structure, and it seemed a good investment to create such an atmosphere catering to like-minded people, yet keep it affordable.

At Spanish Cove, a major renovation was completed before the first diver was booked. The 21 rooms were extensively remodeled, the kitchen facilities upgraded and a beautifully efficient dive shop built on the premises. Designed



photo/Geri Murphy



with both the customer and staff in mind, the dive shop can fill over 100 tanks per hour, has complete scuba gear rental and a gift shop. Probably the single greatest improvement to the facility, however, was the construction of a protected boat slip and breakwater, all directly adjacent to the dive shop.

Here the expertise generated in marine oil and gas projects was readily utilized. George Cundiff, a long time friend and associate of John McMillian, was brought in as chief operating officer to oversee the project. He had 20 years of experience in offshore underwater engineering, and pioneered saturation diving with ex-

tensive work experience at depths as great as 1000 feet. To Cundiff, the problems created by the ironshore became just another day at the office. Building the breakwater not only protected the boat docks but caused sand particles held in suspension by the ocean's currents to be deposited along the shoreline. A beautiful sandy beach has since developed, and while winter storms may still create problems getting in or out of the boat slip, the breakwater extension now under construction will be a further improvement.

The physical aspect of a dive resort is crucial, but the people involved will determine whether the operation works. Be-

cause Spanish Cove is a resort catering essentially to divers, John McMillian realized his dive services must also be models of efficiency. In researching who was doing what in Caribbean diving, Peter and Alice Hughes and their operation, Dive Bonaire, kept emerging as the best examples of the ideal blend of customer service and business sense. John McMillian and Peter Hughes met and ultimately merged the two dive operations with Peter serving as the supervisor of dive operations and development for both Spanish Cove and Dive Bonaire.

While the dive operation at Spanish Cove is already smoothly efficient under

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SPANISH COVE

the direction of dive operations manager Jack Scholly, the experience of Peter Hughes can only help to streamline it further. With hotel manager Ben Bosch in capable control of the accommodations and food, and a high quality dive service in operation, the only reasonable concern for the vacationing diver should be the quality of diving. Not to worry.



John McMillian and Peter Hughes discuss the future development of Spanish Cove.

The two boats presently in operation are a new 38 foot Delta deep-V and a Bristol Bluewater 34 foot tri-hull flattop. A third flattop, a 36 foot Cobia tri-hull is on order and a 23 foot Robalo is available for small, private charters. This fleet of boats can provide diver access to a wide range of spectacular spots along the Grand Cayman coast. A brief description of some favorite sites follows:

Fisherman's Rocks: In the Rum Point area, the wall here begins at 45 feet and is populated by fairly heavy fish concentrations as well as black coral, sponges and an occasional shark or ray.

Tarpon Alley: One of Grand Cayman's most spectacular dives, Tarpon Alley may be considered a wall dive with a dramatic vertical precipice beginning at 70 to 80 feet. But, the activity occurring in the high profile spur and groove coral formations at 60 to 80 feet is the most memorable. Here hundreds of tarpon school among the coral crevices, absolutely predictably and easily approached by the diver. There is great photographic potential in the tarpon alone, but combined with the common sightings of stingrays, eagle rays and sleeping nurse sharks, Tarpon Alley is unique in the Caribbean.

Angelfish Ledge: This is a wall dive featuring crevices and caverns with tunnels opening up to the drop-off, named in reference to the many angelfish commonly found at 80 to 100 feet.

Bearclaw: Not all the good diving in the proximity of Spanish Cove requires diving along a wall. Bearclaw is an example of the numerous fascinating shallow reefs. Sitting in 25 feet of water and populated by all manner of reef tropicals, the most dramatic feature is a bearclaw-shaped coral head 25 feet in diameter at the top of a ledge that drops to 50 feet.

Little Tunnels: In 20 to 60 feet of water, Little Tunnels is a dramatic spur and

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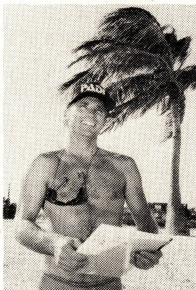
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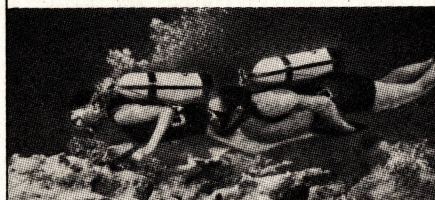
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Nikonos Vs. Housed Cameras

in the July issue of

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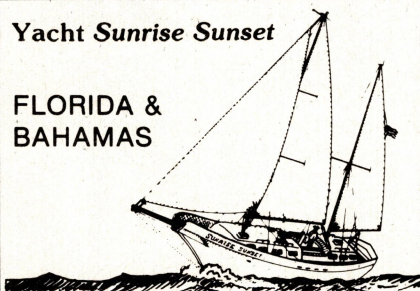
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SPANISH COVE

groove system overhung in places, reminiscent of tunnels. This is an especially good night dive with lobsters, octopus and abundant macro subjects, all within one-quarter mile of the resort.

Trinity Caves: Here the wall starts at 55 feet with four tunnels leading into a large coral amphitheater adorned with black coral and fish cleaning stations.

Big Tunnel: An immense cavern of marine beauty runs from 60 to 110 feet and opens up on the wall. From there one may cruise along the drop-off or follow another series of tunnels leading back to 60 foot depths.

Oro Verde: The Oro Verde is a 187 foot ship sunk intentionally by local dive operators off the Seven Mile Beach area in 50 feet of water to serve as an artificial reef and dive attraction. As a result of the thousands of divers visiting the wreck annually, handfeeding the fish, large populations of yellowtail, sergeant major and resident angelfish, are commonly seen.

Peppermint Gardens: Another great night dive, and named for the thousands of banded coral shrimp found in the coral recesses, Peppermint Gardens is predominantly a huge staghorn coral forest with sand flats around the reef, heavily inhabited by garden eels.

There are a number of recent developments occurring at Spanish Cove that I as an underwater photographer find especially fascinating. The most obvious is the establishment of a beautiful photo center featuring classroom, darkroom and camera rental facilities. The building itself is nestled among the residential complex, nearby any of the rooms on the property, yet a short walk to the dive center. Air-conditioned, carpeted and tastefully decorated with underwater photographs, the center is an ideal instruction facility. There are individual light tables, a blackboard, impressive conference table and ample seating and shelving for student comfort. Camera maintenance/repair kits are issued to students during classes and dissolve slide projection facilities are used to view the results.

Overnight E-6 processing is accomplished by an Image-Maker II automatic processor which may accommodate up to ten rolls of 35 mm film in a single run. The film is available either mounted or unmounted and the whole operation is intended to function under the supervision of a resident photo pro.

Guest photo instructors are invited to come in regularly and utilize the photo center on a rental basis. For example, I run four advanced underwater photo seminars annually at Spanish Cove and find the facilities to be quite outstanding. In fact, since the housed Sony Betamax underwater video unit has been purchased by the resort for both scuba and photo in-

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struction, I consider the facility state-of-the-art. We use the video camera to help diagnose typical photo student problems such as improper strobe positioning, faulty buoyancy control, distance misestimation, etc. In addition, the immediacy of the video playback makes it possible to teach cinema basics.

To complement this innovation in diver/photo instruction, Spanish Cove has installed a video viewing center in the upstairs bar area. Tapes of the day's diving can be played back, as can prerecorded movies, on the large five foot screen.

The only major problem I can see with Spanish Cove, given the quality of the operation, is that there are too few rooms. Already there are problems securing reservations at peak periods and as more people learn about the services available at reasonable prices, the problem will intensify. Fortunately, expansion is already projected and by October there will be a total of 48 rooms, an expanded food service area and new boats. To contact Spanish Cove, write P.O. Box 1014, Grand Cayman, British West Indies. For reservation information, call toll free (800) 231-4610 or contact any of the fine tour agents representing the property. ✽

TREASURE CAY

Treasure Cay Beach Hotel and Villas on Great Abaco in the Bahamas is offering special introductory vacation packages through December 17. The four day/three night Treasure Divers Scuba packages include air-conditioned accommodations; introductory scuba lesson; one open water scuba trip including all equipment; and complimentary golf, tennis, snorkeling gear, sailboats, and chaise lounges at beach and pools.

Treasure Cay's Diving Centre at the marina is operated by the Underwater Explorers Society (UNEXSO). Diving lessons include three hours' professional instruction in a pool, followed the next day by a shallow reef dive led by the instructor. Additional guided reef dives, night dives, multi-dive discounts, daily snorkeling trips and special snorkeling packages with half-hour lesson in the pool and boat trip to the reef are available. Free underwater slide shows are presented weekly.

For reservations or information, contact any travel agent or Treasure Cay Beach Hotel and Villas, 2801 Ponce de Leon Blvd., Suite 410, Coral Gables, FL 33134. ✽

BAHAMAS DIVING PASSPORT

In our Bahamas Special Supplement (April 1983) we listed an incorrect telephone number and an incomplete address. For more information regarding the Bahamas Diving Association Diving Passport program contact: Miss Maura Brassil, Bahamas Sports Information Center, 255 Alhambra Circle, Suite 425, Coral Gables, FL 33134 or telephone toll free: (800) 32-SPORT. ✽

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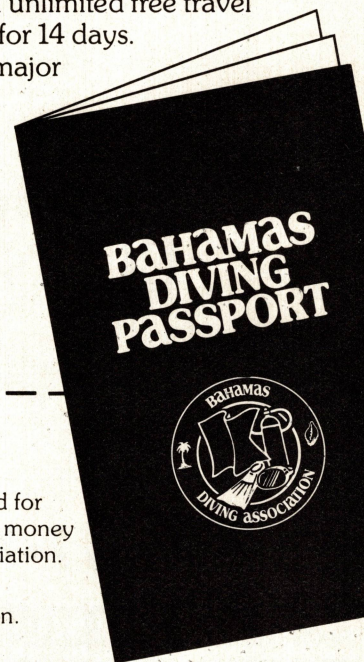
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HOTEL

BONAIRE SCUBA AIR

The Council of Underwater Resort Operators (CURO) in Bonaire has established a program which will guarantee that scuba tanks will be filled with air of higher quality than that called for by either the U.S. Navy or U.S. Compressed Gas Association Standards.

Bonaire already has island wide prohibitions against spearfishing or coral collecting and also regulates anchoring in or polluting dive sites. Now, the dive operators of Bonaire have formed a council to ensure that the quality of dive services offered to Bonaire visitors are unsurpassed.

As part of this standard of professionalism, CURO recently purchased an air quality analyzer capable of detecting even extremely low levels of contamination. This unit has been installed in the Marine Research Facility at Captain Don's Habitat. All the council members will have their air quality monitored frequently so that divers will receive air that is possibly the purest in the Caribbean.

Members of the council are: Bonaire Scuba Center (Hotel Bonaire), Buddy Water Sports, Captain Don's Habitat, Carib Inn, and Dive Bonaire (Flamingo Beach Hotel).

WEEKENDS AWAY

Air Florida and Weekends Away Travel are offering 1983 scuba packages to Ambergris Cay, Belize; Harbour Island, Bahamas; and Runaway Bay, Jamaica.

Ambergris Cay features two resorts, El Pescador and Ramon's Reef. Group summer rates for a seven day, six night package include round trip air fare from Belize city, double room occupancy, three meals per day, two dives per day (five, two tank dives on the six night package) including boat, guide, tanks, weightbelt and backpack.

Romora Bay, Harbour Island, Bahamas, is reached via North Eleuthera Airport with non-stop service from West Palm Beach, Ft. Lauderdale and Miami. Four day/three night dive packages are available at summer rates. Seven day/six night packages are also available. Prices include room, three meals per day, and two, two tank dives (on the three night package) and four, two tank dives (on the six night package).

Club Caribbean, Runaway Bay, Jamaica is served by Montego Bay and includes round trip transfers. Four day, three night packages and eight day, seven night packages are available. Room, two meals daily (breakfast and dinner), and six dives on the eight night program are included. All programs include room, taxes and gratuities. Non-diver, single and triple rates are available from the operator: Weekends Away Travel, 6015 Garfield St., Hollywood, FL 33081.

STETSON BANK

Texas Gulf Dive Site A Fishbowl of Caribbean Reef Life

BY KEN KNEZICK

"The only problem with this trip...is these people are going to think this is what gulf diving is really like."

Fortunately, 32 Houston Underwater Club and International Divers Club divers were able to enjoy the superb day on Stetson Bank that prompted trip leader Ken Young to make this observation.

Many factors combine to make a successful dive trip, and on Sunday, September 19, 1982 everything seemed to go our way. The first clue was the weather. The trip, originally scheduled for the previous week, had been canceled when the U.S. Weather Service offshore forecast called for high winds and eight to ten foot seas in the Texas gulf. But on this day we were to find the sea flat calm with wind and current all but non-existent.

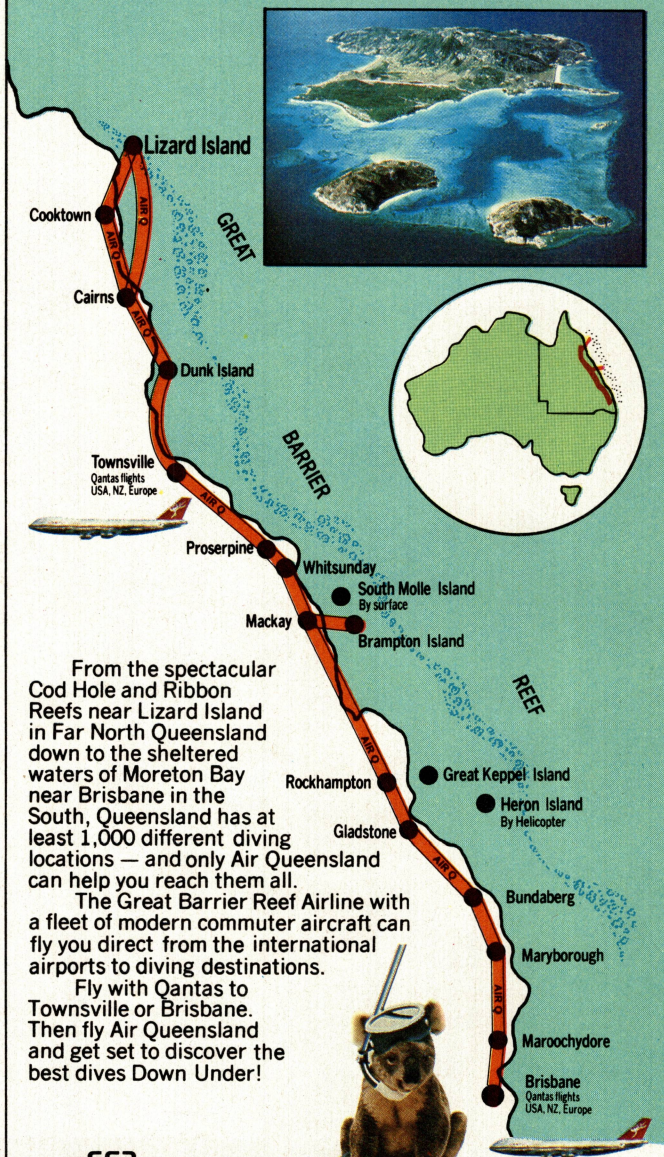
For offshore diving a good boat is essential. Our air-conditioned dive vessel, the 80 foot, all aluminum *Miss Vickie*, out of Freeport, Texas was just the ticket. Equipped with all the necessary electronics for this four hour offshore run, the *Miss Vickie* is skippered by a competent, accommodating, Coast Guard licensed captain. We were additionally fortunate to have Aqua Safari veteran, Jess Stark, aboard. Jess not only provided us with a Zodiac chase boat, but also was able to guide us to a prime spot on the very edge of the bank.

The boat was great, the weather excellent, the company better yet, but the unquestioned star of the day was the dive site itself. Stetson Bank is approximately 70 miles SE of Freeport on the way to the famous Flower Gardens Reef. It is an upwelling of rocky plateaus and pressure ridges placed atop a salt dome. A sonar depth tracing of the area looks like a sketch of a cowboy's headgear, hence its name, Stetson. The terrain at our anchorage started with rocky towers in 55 feet of water, falling off the edge of the ledge to about 150 feet. The rock formations are covered in a mosaic of different types of sponge growth, fire coral and algae, with a notable growth of star coral as well. This terrain provided a harvest of cowries, whelks, spiny oysters and lion's paws for our shell collectors.

Perhaps the most beautiful and surprising quality about Stetson Bank is the remarkable quantity and variety of fish life which it harbors. My list of sightings, added to the reports of our fellow divers, reads a lot like the index to *A Fishwatcher's Guide to Caribbean Reef Life*. We saw numerous queen, blue, gray, and French angels, various species of jack, squirrel, grunt, and damselfish, scorpionfish, parrotfish, Spanish hogfish, mackerel, large barracuda, snapper, grouper, goatfish, cowfish, filefish, queen and ocean triggerfish, surgeonfish, wrasse, blenny, spotted drum...get the picture? Not only that—we saw banded coral shrimp, bristleworms, slipper lobster, a moray eel, and even a great sea turtle which Jess Stark rode up to the surface for all to see. And, all of this beauty and excitement was in our own Texas gulf.

Well, as Ken Young has reminded us, we cannot always expect to find such superb conditions, 100 foot visibility, and great dive buddies. But you can bet that we're keeping our tanks filled and our dive bags packed, just in case. 

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Don Foster's Dive Grand Cayman

BY DAWN CAHOTY

PHOTOGRAPHY BY GERI MURPHY

The most recent dive industry success story involves a Renaissance effected by two, long established Caymanian families whose modern, not medieval, business approach has created a complete vacation complex on Grand Cayman's Seven Mile Beach.

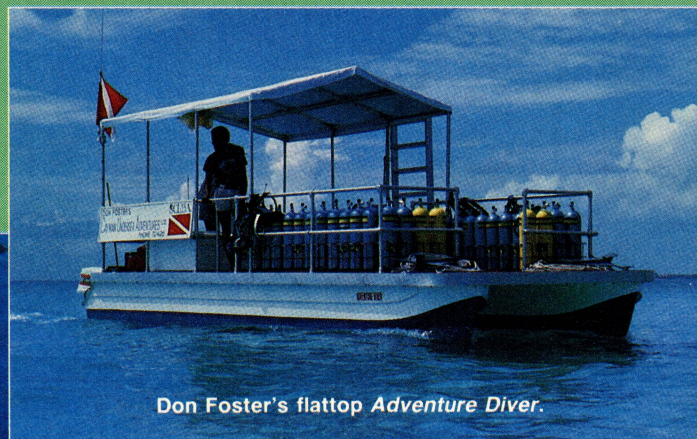
Occupying one of the largest stretches of prime beachfront property on Grand Cayman's west coast are the Coral Caymanian Hotel, Coral Apartment condominiums and the Royal Palms Hotel and adjacent apartments. Together they offer every possible vacation lifestyle; from full-service hotel rooms to luxuriously appointed one, two or three bedroom condominiums. These sister properties share a full service scuba facility, Don Foster's Dive Grand Cayman Ltd., based at the Royal Palms.

Here, through a careful blending of the best qualities of old and new, divers can now enjoy the best of both worlds, on-shore and offshore.

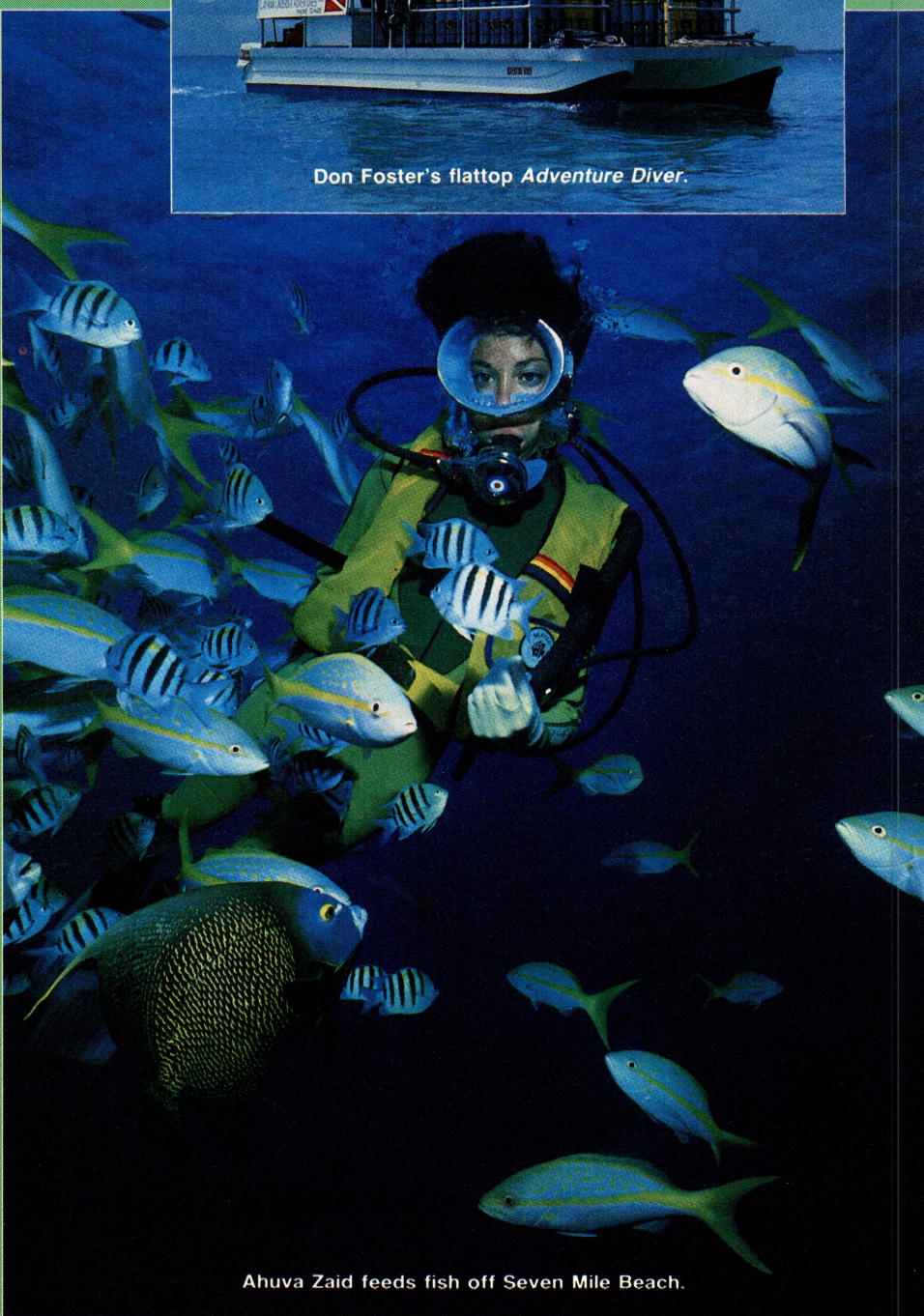
Early in 1982, the Kirkconnell family (well-known for its business sense and successful shipping and merchant activities in Cayman) purchased the 60 room Royal Palms. A plan was then devised to combine the attractions of the larger resort with those of the 25 unit Coral Caymanian Hotel next door, which the family had owned for over a decade. To keep this resort a family operation, the dive concession was taken over by nephew Don Foster, whose 15 years of experience in Cayman's dive industry made him a natural choice.

The Renaissance mentioned took place January 14, 1983, when Royal Palms owners and management officially announced the rebirth of this 16 year old hotel by throwing a gala poolside cocktail party for island VIP's, press and travel industry representatives from the U.S.

In the past year, shabby became chic, the result of a \$600,000 renovation program which restored the quality this property became famous for a decade earlier as La Fontaine. It also introduced an exciting variety of recreation options for guests staying in either sister property.



Don Foster's flattop Adventure Diver.



Ahuva Zaid feeds fish off Seven Mile Beach.

During the renovation program, the Royal Palms', 40 superior rooms were completely stripped, redecorated and refurnished, and the 20 units in the main building were refurbished for a total of 60 "new" rooms.

The original thatched-roof poolside beach bar, a popular watering hole for locals and visitors alike, was replaced with an attractive open-air structure which quickly drew the old crowd back for sundowner sessions each afternoon.

The new owners didn't neglect any renovation detail, from the centrally-located freshwater pool, to the intimate Casablanca pub (whose tropical wicker decor reflects the mood its name suggests). A

those who prefer the privacy and flexibility of a housekeeping holiday might consider the reasonably priced 28 units available adjacent to the Royal Palms, or the 11 Coral Apartments luxury condominiums next door. Those staying in these enjoy the same privileges as the hotel guests enjoy.

The Terrace Room restaurant overlooking the Royal Palms pool and deck area is open for breakfast (7:30-10:00 daily) and dinner (6:30-9:00 pm). On Tuesday and Saturday, island-style barbecue buffets are held poolside, with a top local band and dancing after the Saturday buffet. Lunchtime barbecues are available daily in the deck area.

the past 15 years. Establishing his own dual-resort, full service dive operation was the logical way to apply the knowledge he had gained firsthand. Previously, his small shop had been located at the Coral Caymanian and the move next door meant a complete expansion program for the business.

Assisted by wife Jil, Don added a second boat, extensive supply of rental gear and retail dive shop in the Royal Palms lobby. Early in 1983 the name of the operation was changed to Don Foster's Dive Grand Cayman Ltd.

What impresses customers immediately is more than the personal, friendly service they experience while signing up for dive trips in the retail shop, or Don's offbeat wit describing the day's dive plan. This is an operation whose onshore facilities and equipment provide quality matched by Cayman's U/W attractions.

There's a definite display of organization in this operation. It's large enough to provide every amenity, but small enough to offer personalized service. The dive boats leave on time for the morning two-tank dive at 8:30 am or the afternoon one tank dive at 1:00 pm.

Don's stated operating philosophy is, "more service means less stress." He recognizes that good diving begins before the boat leaves the beach. Divers are assisted onboard with their gear, and that's the last thing they have to do until the boat arrives at the dive site and they roll off into the water. Tanks are set up by Don's divemasters and guests are helped into their gear: this is effortless diving.

Don operates two Bristol Blue Water flattops, the 26 foot *Adventure Diver* which takes a maximum of 12 divers and the 36 foot *Undersea Diver*, which carries up to 20. Guests literally step out of their hotel or condominium onto Seven Mile Beach, where the boat picks them up.

Dive Grand Cayman Ltd. specializes in catering to underwater photographers and Don selects his sites according to weather conditions and diver interest. Dramatic wall dives exist within a short 10-20 minute ride, offering wide angle enthusiasts awesome panoramas of opaque blue seaspace.

One of his favorite sites is Sentinel Rock, a 10 minute trip from Royal Palms beach. This is a huge coral outcropping, a fusion of different hard corals, which rises like a monument from 175 to 95 feet on the edge of the drop-off. It is the convention center for a menagerie of marine life including huge basket sponges, colorful yellow and green tube sponges, swarms of tropicals and occasional pelagics such as green sea turtles. Schools of deep water snapper (local name, silks) frequent this site, something seldom seen by divers. Since all deep dives are restricted to 110 feet, divers experience only the top of Sentinel Rock, but for photographers especially, this site is busy



Jil Foster teaches introductory scuba in the pool at the Royal Palms Hotel.

Don Foster and his pet dog Scuba.



Royal Palms Hotel



Coral Caymanian Hotel

beauty salon and small grocery/liquor store, The Market Basket, were added in the main building. This resort even offers the island's most unusual entertainment: It is currently the home of Cayman's enterprising Inn Theatre Company, which presents a variety of productions, from drama to musical comedies, during the October-June season.

Royal Palms' topside facilities are shared by guests at the two hotels. And

In 1982, the Royal Palms became home for Don Foster, and both the resort and Don's operation have a new image: The Royal Palms as a quality hotel and Don Foster as Dive Grand Cayman Ltd.

Don started his own dive operation in 1981. As Cayman Undersea Adventures he operated a 26 foot Bristol Blue Water flatop as an independent serving Seven Mile Beach. The 31 year old Caymanian has worked in Cayman's dive industry for



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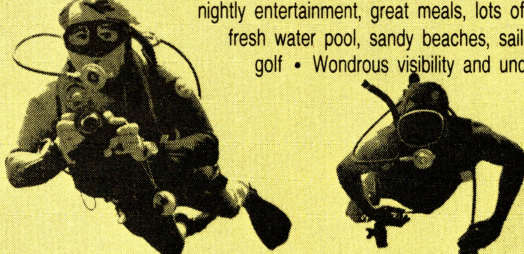
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DIVE GRAND CAYMAN

enough to provide profitable bottom time.

Another favorite first dive is Cayman's famous Orange Canyon, where between 70 and 100 feet, the drop-off resembles an artist's palette of invertebrates. Sprawling flat orange sponges, tangles of red, lavender and green rope sponges, curtains of deepwater gorgonians and patches of black coral make this site one of incredible beauty for wide angle shots.

The second dive will be on one of Cayman's many fine shallow reefs, allowing maximum bottom time in 25-40 feet for macro photography and fish feeding sessions. Don is partial to sites such as The Aquarium, where plentiful fish and abundant "little stuff" will entertain divers in quantities as this site's name suggests.

About one-third of Don's dive trade consists of photographers, but those without experience in underwater photography will find the services of dive-master Darvin Ebanks an unusual opportunity. Darvin is one of few Caymanians accomplished in marine photography, and several dives each week he offers underwater portraiture sessions. Divers can pose for fun and purchase a unique souvenir of their trip. Darvin develops the slides and divers can select desired shots during an evening slide show at the Royal Palms.

Dive Grand Cayman Ltd. also offers resort and full certification courses upon request. Both Don and Jill, are instructors: Don holds PADI and SSI ratings and Jill, SSI. Other staff members include YMCA instructor Sandy Cober, PADI dive-masters Darvin Ebanks and Ollen Miller and trainee-divemaster Miguel Diaz.

Dive Grand Cayman Ltd. is a PADI International Training Facility and SSI Store which offers check out dives for YMCA, PADI, SSI and NAUI.

The operation's equipment storage center and dive shop is at the rear of the southern wing of rooms and is an unpretentious but spotless unit. Don is a confessed fanatic about equipment maintenance and the two-year old Worthington compressor looks like new. Rental BC's and regulators are kept in excellent condition because Don has a complete repair facility now available in the shop, featuring all equipment necessary to repair most brands of regulators. In stock are 105 aluminum 80 tanks.

The retail shop in the Royal Palms lobby offers a wide selection of gifts, including T-shirts, black and pink coral jewelry and shells, plus dive gear and rental snorkeling equipment. Rental camera gear is also available, with overnight E-6 and color print processing arranged at the desk.

Dive Grand Cayman Ltd. can also book a variety of aquatic activities for non-diving vacationers, including deepsea fish-

ing charters, sailing, snorkeling trips and North Sound native-style cruise and beach picnics.

Grand Cayman as a top-ranking dive destination offers divers a world of exciting sites and Dive Grand Cayman Ltd. works to show divers the best of that world. Every available vacation option is offered onshore, from the quiet beach-front rooms of the Coral Caymanian and ocean or pool-view rooms of the Royal Palms, to quality apartment units on both properties. Divers can have a Cayman vacation any way they want it.

For information and reservations contact: P.O. Box 151, Grand Cayman, 92636 or phone 9-5679 on the island. In the US: Divers Unlimited Inc., 6023 Hollywood Blvd., Hollywood, FL 33023. Outside Florida, (800) 327-2740; in Florida (305) 981-0156. ✕

MCKENNEY TO SEA OF CORTEZ

During the past two years Jack McKenney shot and produced *The Devilfish of el Bajo*, a film about manta rays, hammer-



head sharks and other sea life found on El Bajo, a seamount 30 miles N.E. of La Paz in the Sea of Cortez.

In August Jack and his wife Sari will be conducting a one week dive trip aboard the 120 foot *Baja Explorador* to El Bajo. The ship will be anchored on the seamount for five full days. The trip will run from Sunday, August 14 through Sunday, August 21, with two nights in La Paz.

For more information, contact Expediciones Baja S.A. c/o Mona Rouse, P.O. Box 8998, Santa Ana, CA 92703. ✕

BRAC FANTASY

The Brac Reef Hotel on Cayman Brac has a Fantasy Flight package in which everything is included, even unlimited beverages and cigarettes for guests personal consumption.

Fantasy Flight is available until November 30 through the offices of Caribbean Hotel Management in Hollywood, FL. The package includes air fare from Miami, transfers, air-conditioned room, three meals daily, T-shirt, gratuities and service charges, all government taxes, two, one tank dives daily, unlimited shore diving, a trip to Little Cayman (weather permitting) and more.

For complete details and reservations contact Caribbean Hotel Management at 5920 Rodman Street, Hollywood, Florida 33023. ✕



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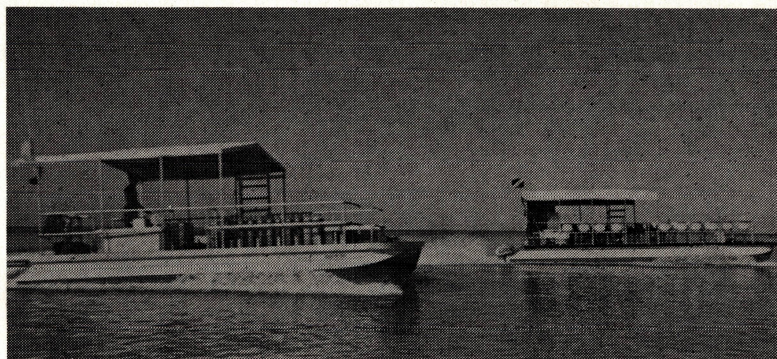
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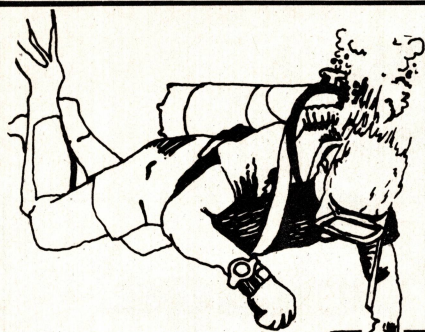
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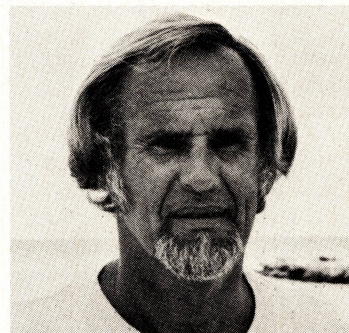
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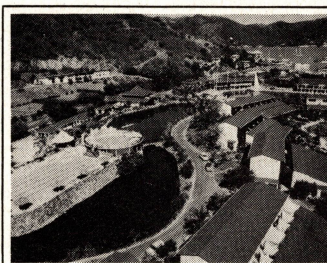
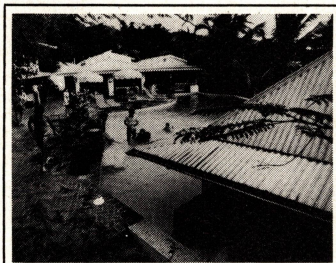
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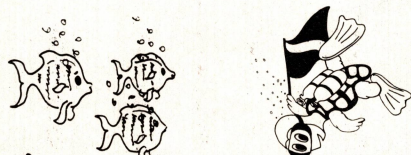
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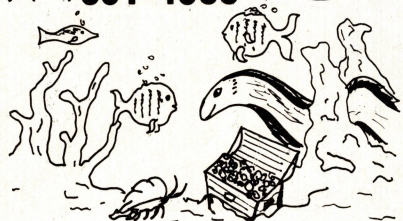
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110 SKIN DIVER JUNE 1983

Montana Cleanup Dive in Glacier National Park

BY JAMES OLESON
AND BRAD JOHNSON

On Sunday, June 13, 1982 a unique dive event took place on the south shore of Lake McDonald. In Glacier National Park, Montana, McDonald is a glacier-fed lake, the temperature of which seldom rises above 40°F. It is surrounded by tall, forested mountains topped by snow. Through organizational efforts of a Kalispell dive shop, The Sportsman and Ski Haus and with authorization of the National Park Service (NPS), a cleanup dive and picnic was scheduled.

While the primary purpose of the Lake McDonald outing was a bottom cleanup, another purpose was to afford local divers an opportunity to get acquainted and discuss plans for a divers' club. Organized dive events create enthusiasm and attract both experienced and new divers.

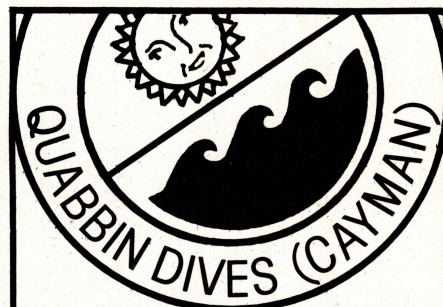
After registration, there was ample time to meet the other divers and to socialize over coffee before a short briefing by NPS dive personnel, the divemaster and surface helpers. Just before noon the buddy teams were logged in and briefed about the area to be cleaned up, which was marked with floats designating the limits ranging down to 90 feet. Collection points were established on shore. Team members were limited to one tank of air and encouraged to dive no deeper than 50 feet. Collection sacks, as well as float lines, were towed by each team as an aide for surface observers in monitoring location and direction of the divers. Visibility was approximately 20 feet, with the temperature being 40°F.

Thirteen teams participated in the afternoon dive and covered the designated area thoroughly. When the last team left the water, a series of junk piles had been accumulated. Shovels, canteens, fire equipment, tires, machine gears, broken china and cooking utensils, intermingled with 50 years of beverage containers, made up the bulk of items brought ashore. In all, 26 divers retrieved 1145 pounds of material from the lake.

Each team was asked to select one item it deemed most unusual and submit it for judging by an NPS panel. The winning item was unique—a fully intact bottle from the long defunct Kalispell Brewing Company, which probably had been resting on the bottom since the 1920's.

The largest single item was a five foot length of railroad track weighing 135 pounds, which was brought in by a former pro football player: He had removed his flippers and walked ashore on the bottom of the lake.

The unpredictable early June weather
(Continued on Page 119)



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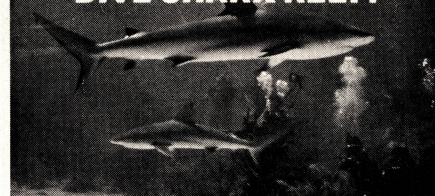
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CORAL CAVES OF PENNEKAMP

BY DOUGLAS J. COOK

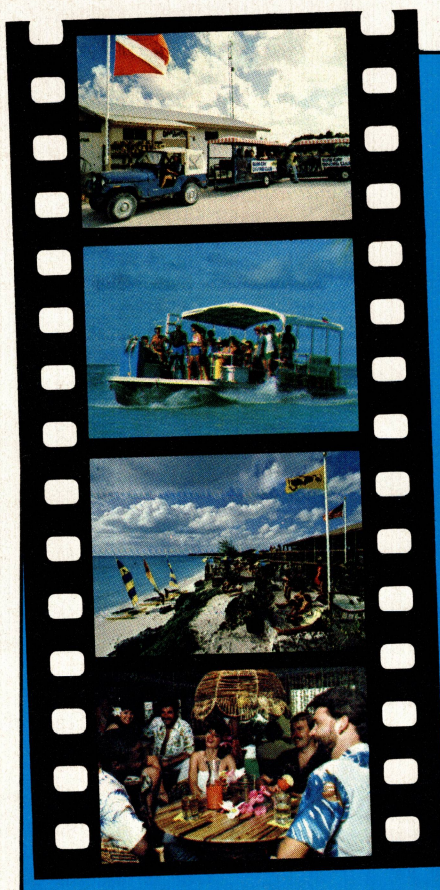
Seeing the silver cloud in the water below my charter boat *Mary-Metro*, I knew summer's magic had again visited Pennkamp Coral Reef Park in Key Largo, Florida. With our wetsuits gladly left behind, my wife Elizabeth and I slipped into the inviting 85°F water at Watson's Reef north of Pennekamp's Elbow. We swam a few yards to where the baitfish were crowding around, and in, Harrison Cave. The silverside minnows congregate around coral caves only in the summer.

A million silver jewels moved with one mind in a living wall around us. The effect was totally enchanting. Floating as in a dream, we found ourselves in an impulsive embrace at four fathoms. The imaginary force that was holding back the tiny fish evaporated. It was an odd sensation to have the silversides bouncing off our bare skin.

Then the dream turned to a show of nightmare violence. A dozen hungry bar jack coralled the minnows into a tight ball

near the surface. The school became a bizarre silver flying saucer, 20 feet across, constantly changing shape as it flew over the reef. The bar jacks, joined by excited 'cuda and grouper, thrashed through the bait with jaws gnashing. The surface boiled as bait and predator leapt into the air. Yellowtail snapper cleaned up still wiggling minnow heads and half bodies left from the five minute frenzy.

The coral caves of Pennekamp can be the highlight of any reef dive in any sea-



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photos/Douglas J. Cook

son. Besides their natural beauty, each unique limestone grotto tends to attract marine life. Copper sweepers, snook, black margate, grouper and an occasional giant jewfish inhabit the caves. Angels and butterflies orient themselves upside down, grazing on invertebrate delicacies that grow only in the eternal dark of the cave ceiling. The farthest recesses may be concealing that five pound lobster you've been looking for!

Although you should always exercise caution and common sense you won't find these caves to be dangerous. You may want a dive light to reveal the true color of sponges and other marine growths found, but the light isn't essential in the daytime since blue streamers of sunlight will mark your exits. Be careful not to scrape any exposed skin or to bump your tank valve.

Pennekamp's coral caves are never as extensive as their inland counterparts. The areas I'll describe might be impressive archways, single rooms with several doorways, or winding tunnels up to 25 yards long with several rooms and exit holes along the way.

French Reef is the site of several well known caves and "swim throughs." The best among these is Christmas Tree Cave, a broad, sand-floored room below a conspicuous cone-shaped star coral, for which the cave is named. An experimental mooring buoy is anchored a few feet from here. The buoys are helping to keep boat anchors out of the fragile living coral formations.

Little Grecian, a patch reef just 250 yards north of Grecian Rocks, is perhaps the most diverse and scenic of Pennekamp's inner reefs. There are two notable caves here. Cathedral Cave is on the extreme ocean side of the reef, hollowed out under a large formation of star and brain corals known as the Skyscrapers. Hole-in-the-wall is a 15 foot long tunnel through a coral spur, farther inshore.

The Minnow Hole is a popular dive site

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TOO FAR FROM SHORE

BY ANN M. BARRY

I inhaled slowly and deeply, controlling the urge to hyperventilate. Teetering on the edge of panic, I willed myself to slow down and calm down. I imagined the same thoughts filtering through my husband Bill's mind. Then he grasped my hand. Together we kicked hard just to remain stationary in the powerful current that threatened to sweep us out into the endless Pacific Ocean. When the kelp straightened momentarily, we kicked fast and fiercely in a hopeless attempt to gain headway toward shore.

I ignored the pressure gauge dangling at my side. I had just checked it seconds before. Without a doubt there was not enough air to last until landfall at this lazy inchworm's rate of movement. And even with my panic straight-jacketed, my exhausted muscles required far more air than I'd normally consume.

We'd already determined that swimming on the surface presented as many difficulties as underwater: Huge, stomach-wrenching waves assumed sadistic duty. Also, our lungs, constricted by wetsuits and fully-inflated BCs, could not capture enough air through snorkels. Our feeble attempts always resulted in us bobbing around like Ping-pong balls, gasping for air, and floating ominously toward the empty horizon.

Never before had an underwater venture frightened me. Never before had I seriously contemplated drowning.

Our predicament started at La Jolla Beach, California. Bill and I were not novice divers. We had completed the PADI basic certification course four years earlier. Since that time we logged 53 hours of diving time in 59 dives. We had also taken advanced courses and now held the PADI divemaster rating. Additionally, we always dove together and possessed a thorough knowledge of each other's strengths and weaknesses.

Our previous dive experience was varied: We dove in Pennsylvania rivers with depths to 40 feet. Some quarries offered underwater tunnels for our exploration. We descended to a depth of 100 feet without ill effects. In Colorado high country lakes we shivered in 42°F water. Sometimes the lakes were so murky that the bottom could not be visually distinguished from the water. You knew you'd hit bottom when the mud began sucking you down.

In our advanced classes we perfected navigation skills. Under harsh conditions we enacted simulated decompression and equipment retrieval. And we logged several night dives. We believed ourselves to be competent divers.

Never did we take into account the fact that *all* our diving had been inland. Neither Bill nor I had ever entered the ocean with scuba gear. Of course, we studied ocean diving. We learned about tides, undertows, currents and monsters of the deep. Numerous times we heard the suggestion that inexperienced divers shouldn't enter an unfamiliar area without a guide. The warning had never applied to the lakes and quarries we visited. We didn't think it applied to La Jolla, either. We discovered differently.

The first day we drove to the beach, the weather was cold and windy. Whitecaps adorned the sea. No Swimming signs littered the beach. The second day offered more of the same. By the third day we felt desperate. Time gnawed at our vacation and we still hadn't seen the underwater world of the Pacific. However, the sea had calmed somewhat and the dire warning signs had been removed. So we decided to dive.

A few swimmers splashed about, but no one else was donning scuba gear. We carried all our equipment to the beach and began preparing. Spectators probably assumed we knew what we were doing. No one told us not to swim too far out from shore.

And that is exactly what we did. During the jaunt from shore we were so engrossed in the scenery that we barely noticed the boost the current was giving us. We just thought we were traveling as far as we would have in a placid lake. Eagerly, we watched flashy garibaldi pop out of kelp jungles. Bill pointed out a starfish and I discovered a small ray. We were overjoyed to encounter such creatures, animals never found in Colorado lakes or Pennsylvania rivers.

When we'd used one-third of our air, we reversed our direction, according to safe diving procedures. Although we knew the correct compass heading, we

surfaced out of simple curiosity. The people on shore appeared as Lilliputians. I felt the first slight constriction of my throat. How had we swum so far?

But I didn't fully comprehend the danger until we sank below and tried kicking toward shore. Then we discovered the force of the current. Finally, after what seemed like hours, I signaled to Bill to surface. The shore looked no closer than it had before.

As we floated, I tried to imagine a path to safety. Then I remembered a Red Cross life saving course. The instructor had recommended swimming at an angle across a current instead of plunging directly into it.

"Let's try swimming diagonally to shore," I suggested.

Bill added, "We ought to go just below the surface to avoid the waves. We'll use less air than at the very bottom."

So we dropped about 10 feet down and began angling toward shore. The next inspection revealed we were finally making progress. Slowly but surely, we kicked with all the strength in our legs. Bill's tank went dry when he was within 30 feet of shore. But he could snorkel that final distance. My air disappeared just as my feet touched bottom.

Like dying whales, we beached ourselves several hundred yards downshore from our starting point. My wobbly legs could barely manage the trek back to the car with a heavy tank hanging from my shoulders. But I exerted that final effort. At the car I dropped to my knees, exhausted and fighting tears. I'd never loved land so much.

Perhaps, the most frightening aspect of our encounter with the ocean was that it didn't happen to novice divers. According to most standards, we had plenty of knowledge and experience. That background did help us manage our fear and save ourselves. What it didn't do was humble us sufficiently before the vast power of the ocean. Prior to this incident we believed that water was water and we could blithely dive anywhere.

Since that time we have enjoyed many marvelous ocean dives, either accompanied by a guide or after receiving explicit instructions from local divers. We learned a valuable lesson in the Pacific. Possibly, the most insidious enemy of the experienced diver is overconfidence. >>>

CORAL CAVES

and fish feeding station 300 yards north of the Christ of the Abyss statue. This cave hosts many tame grouper including a 150 pound jewfish named Bozo. You may also meet a friendly barracuda, Old Smokey, posing for you and begging for a handout. Fish feeding, however, is best left to an experienced guide since even the tame fish can be unpredictable at dinner time.

Horseshoe Reef and North Horseshoe are two interesting patch reefs about two miles inshore from Pennekamp's Elbow and three-fourths of a mile north of the statue. They both boast beautiful coral caves. Besides the common silverside minnows, these areas may also host huge schools of larger baitfish. If you swim over them, it's like peering into an ocean of rippling mercury. Visibility is totally obscured in the midst of the school.

There are many virtually untouched reefs between the Elbow and Carysfort Reef in Pennekamp Park. Few commercial charter boats venture to them because of tricky navigation and unpredictable visibility. I spent several years exploring these reefs and was rewarded with some of the best diving Pennekamp has to offer. Some of the notable sites are Racetrack Reef, Leopard Reef and Watson's Reef. Leopard has a scenic coral arch in the center of the reef forming a swim through about 10 yards long. Race-track is an oval patch reef with a steep walled perimeter. The wall is a Swiss cheese of mini-caves and lobster holes. It has become my favorite site for macro-photography with its abundance of anemones, shrimp and crabs.

The crown jewel of Pennekamp's coral caves is Harrison Cave at Watson's Reef. This cave winds 25 yards through the reef under a very prominent stand of elkhorn coral. This formation resembles large cannons aimed at Key Largo. One cave entrance is marked by a large kedge anchor thought to be of Spanish origin. Where the passage is narrow you may bump your tank, but there's no danger of getting trapped. Halfway through you enter a large room with a cleft ceiling giving dramatic skylight. I've often found sleeping nurse sharks here and, in season, caught several large lobsters.

Pennekamp Park is without question one of the most popular dive destinations in the United States. It draws divers and underwater photographers from all over the world because of its fish life and easily accessible coral reefs. A large percentage of these divers become addicted and make their pilgrimage down U.S. 1 to the Keys annually. The next time you're in Key Largo, try some of Pennekamp's coral caves and see a reef from the inside out!

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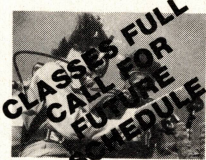
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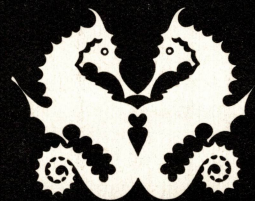
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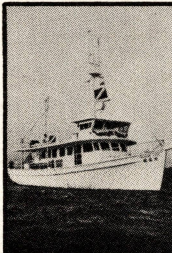
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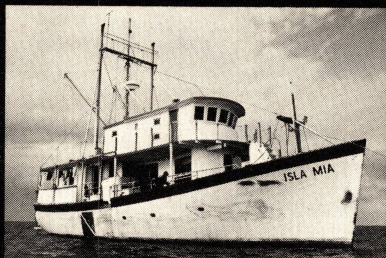
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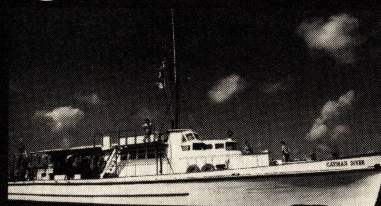
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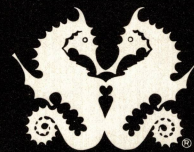


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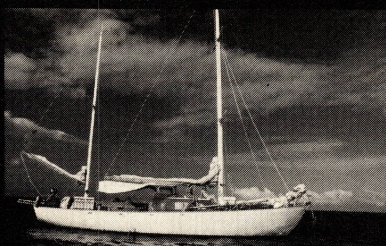


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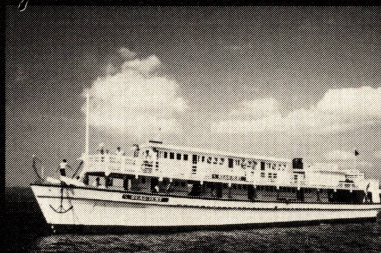
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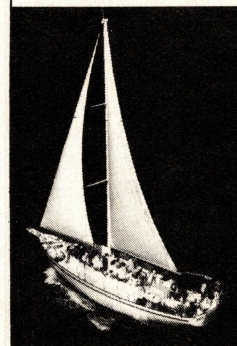
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CLEANUP DIVE

(Continued from Page 110)

cooperated throughout the afternoon to make post-diving socializing comfortable and pleasant. Thanks to The Sportsman and the NPS some excellent prizes were awaiting the winners of three categories: (1) most junk by weight, (2) largest single item and (3) most unusual item recovered. In addition, each diver received a free air fill and a chance to win some great prizes at a drawing. Prizes included liftbags, dive lights, catch bags, air fill cards, NPS books and a composite book of Danny On's wildlife photographs. The Sportsman and Glacier Park division of the NPS worked hard to provide a fine dive, and their efforts were reflected in a smoothly run operation.

Scuba diving is a relatively new use of National Park property, and at the present time, the policy is one of encourage-



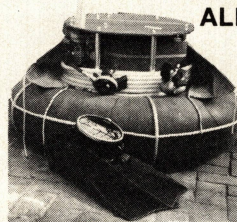
photo/Brad Johnson

ment. The NPS has the authority and duty to regulate all activities conducted within the physical boundaries of the parks and has established certain standards for scuba diving. Currently, the NPS at Glacier Park requires that a scuba diver be certified by one of the recognized instruction agencies and carry a certification card. In addition, a divers down flag must be displayed in the immediate area of the dive site.

Regarding items found on the lake bottom, a diver must be aware that removal of any natural substance in whatever state from a National Park is prohibited. As to trash, there are exceptions, but it should be noted that antiquities are subject to regulation. Old bottles may cross the dividing line and lose the classification of mere trash. If in doubt, do not remove an item but check with a park ranger or other park official prior to recovery or removal from the park. Aluminum cans and broken glass are readily identified as garbage and their removal is appreciated. Please remember that diving is a new park activity and not yet subject to stringent regulations. Each diver's conduct may collectively form a basis for future evaluation of regulatory policy, so have a great time but exercise restraint and good judgment. In short, be a diving goodwill ambassador. >

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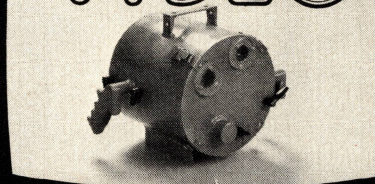
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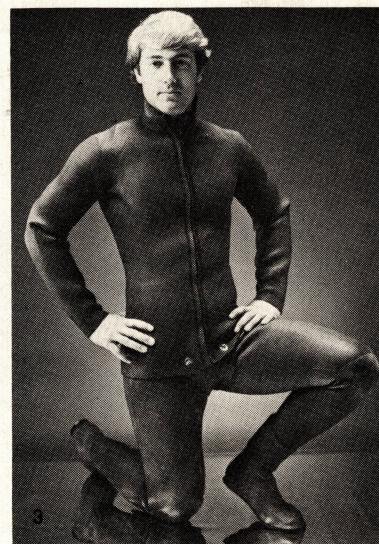
PRE-SUMMER SHOPPER'S GUIDE



1 Tool-Tipped Knife—The 7221-00 (DKS-TK) dive knife from Dacor features a 9 3/16 inch length overall and a five inch 420A stainless steel blade. Knife has flat tool tip, inch markings, serrated edges, sharp edges, line cutter notch and rubber handle with metal tip. Knife comes with a sturdy rubber sheath. \$18.



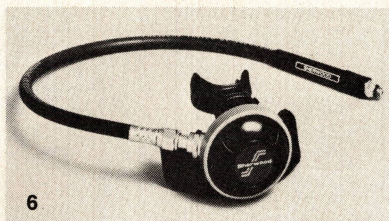
2 Diver's Equipment Pockets—Sea Pockets measure 8 x 12 x 3 inches and buckle around the waist or can be added to existing straps. They can be strapped down or left to adjust themselves to hang properly regardless of the diver's position. \$39.95. From DUI, Inc., 1148 Delevan Dr., San Diego, CA 92102.



3 Waist High Suit—Waist high wetsuit is made of 1/4 inch Rubatex G231 textured neoprene with triple cemented seams and Henderson Dot welded seam ends. Separate collar piece, and bent knee for comfort. Corrosion resistant twist lock fasteners. Suit is sturdy, warm and flexible. \$195.95. From Henderson.

4 Textured Palm Gloves—Deluxe Diving Gloves feature one-eighth inch neoprene material and five finger design. Textured palm gives protection and improves grip. Available in extra small, small, medium, large and extra large sizes. Keep hands warm in style. Gloves are \$26. Available at your Tabata dealer.

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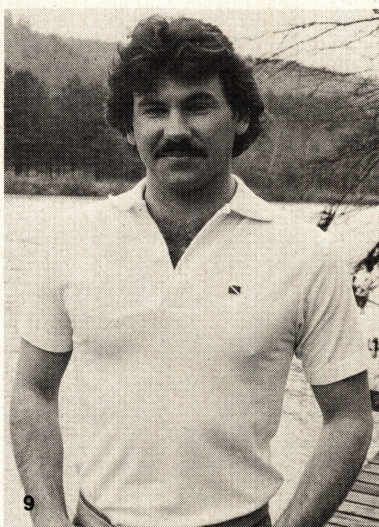


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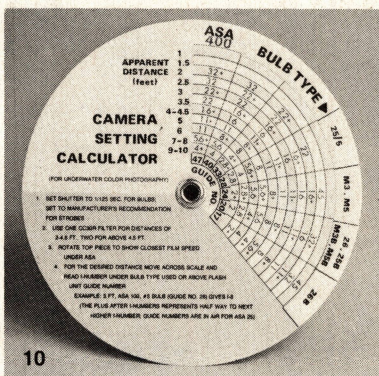
6 Hookah Regulator—For users of surface supporting breathing systems, this second stage works with supply pressures of approximately 60 psi. The Hookah has a lightweight plastic housing, jumbo purge button, silicone diaphragm and exhaust valve and 36 inch hose. \$83.50. Sherwood Selpac dealers.

7 Jacket BC—Deluxe Seachute Jacket features two slanted pockets, five separate adjustment areas, and a Velcro closed flap for an octopus second stage. Urethane coated nylon, the jacket has D-rings, hose retainers on shoulders and quick purge feature in inflation hose. \$350 large, \$335 medium. Dacor.

8 Splashproof Stereo—Aqua Tunes is a submersible FM stereo designed for surfers, sailboarders, etc. Also works with FM microphone. Ear plug speakers and an adjustable neoprene weightbelt. \$89.95. From Product Masters, Inc., Aqua Tunes Division, 1009 Grant Street, Suite 202, Denver, Colorado 80203.



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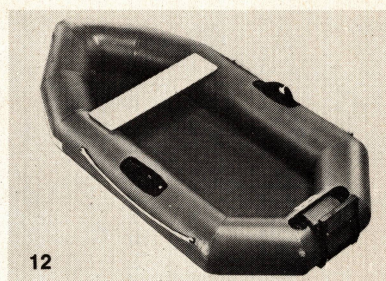


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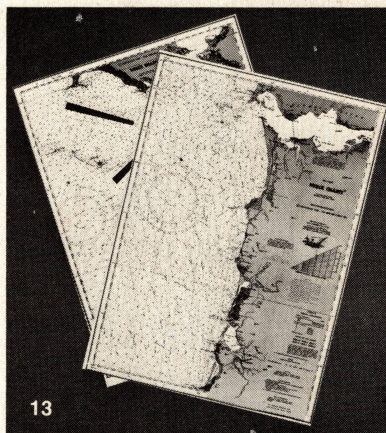
9 Sport Shirt—Classically tailored, the shirt has a small red and white divers flag on the chest. 50 percent cotton and 50 percent polyester for easy care and comfort. Available in navy, white, red, light blue and kelly green. Men's sizes S, M, L and XL. \$21.95. GWC Marketing, P.O. Box 9392, Marietta, GA 30065.

10 Exposure Calculator—Camera Setting Calculator combines data into a handy, waterproof table. The calculator will determine any one of four variables (f stop, film speed, distance to subject, and guide number) given the other three. \$9.50 plus shipping. P.J. Diamondis, 255 Redwood Rd., Merritt Is., FL 32952.

11 Drysuit Mitts—The Henderson Dry Mitt is assembled from a single piece of 1/4" nylon two Rubatex G231 neoprene, resulting in a minimum of seams. Cuff is part of the mitt body, but the rubber surface has been exposed to create a fine seal between suit and mitt. Mitt available in black, blue or orange. \$35.95.



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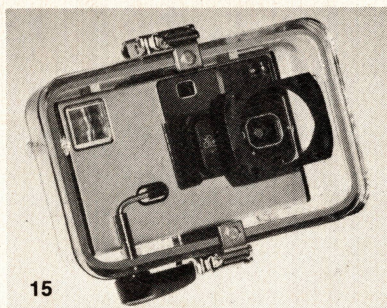


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12 Inflatable Dinghy—The Avon 9 is suitable for family fun or as a yacht tender 9'3" long and 4'6" wide, it is made of double thick Hypalon fabric. The boat comes with a bow rubbing strake, fitted becketts for an outboard motor bracket, oarlocks, lifeline, rigid seat, and a five year guarantee. \$760. Avon dealers.

13 Charts—Pacific Wreck Charts show the location of over 200 shipwrecks from San Diego to Vancouver. Latitude, longitude and Loran C numbers are given. For most, the tonnage, date and cause of sinking, country of registration, etc. are given. \$18 each. Wreck Charts, 11 Creek Bend Dr., Fairport, NY 14450.

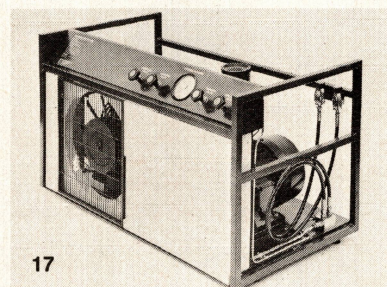
14 Dive Knife—Jean-Michel Cousteau Knives from U.S. Divers (Pro Knives) feature 4 1/2 inch, 440 stainless steel blades. Non-slip handles are five inches long and contoured for easy grip. Quick release sheath. Pro Knife 1 has curved blade with line cutter. Pro Knife 2 has stiletto blade with serrated edge. Both \$45.



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15 Disc Camera Housing—Designed to work with disc cameras that have no front cover, the Disc-Case I comes with a special Water Correcting Lens that allows such cameras to focus as close as 18 inches underwater. System is compact and easy to use; only one control for shutter. \$59.95. From Ikelite.

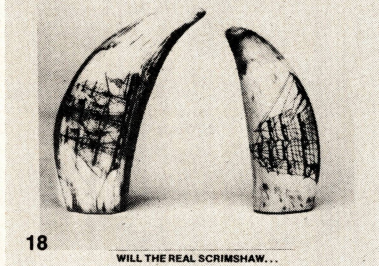
16 Nylon Drysuit—The Typhoon sport suit is nylon/butyl/nylon laminate that is strong and waterproof. Seals at neck, wrists and ankles are latex rubber. Entry zipper across shoulders. Dump valve and power inflator valve. \$695. In-Depth Diving Equipment, P.O. Box 10, Renfrew, Ontario, Canada K7V 4R2.

17 Air Compressor—Five new air compressors have been added to the Bristol Pneumatic line, ranging in output from 7 to 8.5 cubic feet per minute with pressures up to 6000 psi. Prices start at \$4,000. For information contact Bristol Pneumatic Ltd., Lodge Causeway, Fishponds, Bristol, BS16 3JS, England.

NAUTICAL BRASS

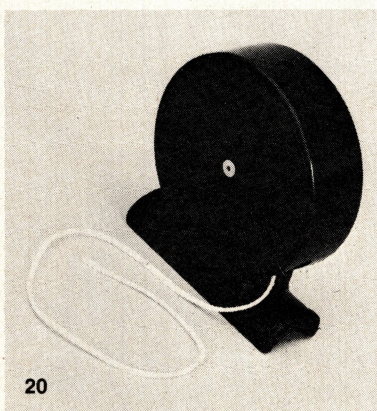
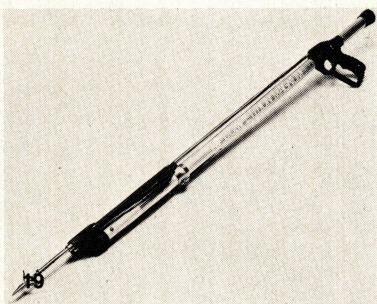


Volume 8, Number 1 For the nautical collector January/February 1982



18

WILL THE REAL SCRIMSHAW...

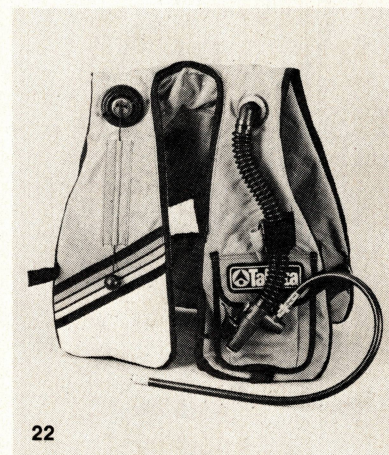
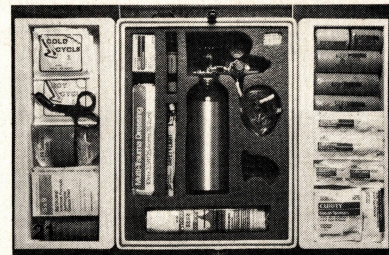


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18 Newsletter—Nautical brass is a bi-monthly newsletter for the collector of nautical treasures. Articles on authenticating items, and restoring and displaying them are featured. \$10 per year. Information or a brochure can be obtained from Nautical Brass, Post Office Box 744-P, Montrose, California 91020.

19 Speargun—Competition Magnum has open muzzle for quick loading. Overall length is 54 inches. Gun has a 3/8 inch diameter, 40 inch long, stainless steel shaft with a twin spinner point. Two slings with retainer. \$120. From JBL dealers. JBL Enterprises Inc., 426 W. Almond Avenue, Orange, California 92666.

20 Speargun Line Reel—The Automatic Line Retrieve Reel fits pneumatic and sling powered spearguns and mounts with hose clamps. Steel spring takes up slack in line gently and constantly. No more time wasted collecting line. \$29.95. M.K. Engineering Design Co., 3349-B Hamilton Blvd., Atlanta, GA 30354.



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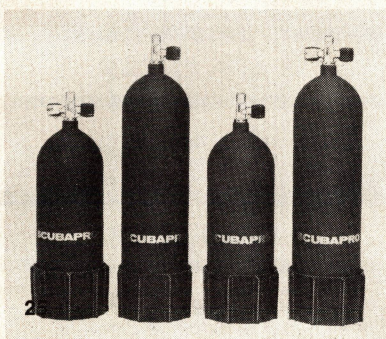
21 Medical Kit—The Seavival 1 emergency medical kit contains: oxygen cylinder, valve and mask; lights; antiseptic; bandages; medical shears and hot/cold packs. Case is O-ring sealed and will float. \$685. Friedman and Hardesty, Inc., Deerwood Park of Industry, 14347 S.W. 119th Ave., Miami, Florida 33186.

22 Buoyancy Compensator—The SDJ-340 stabilizing jacket is designed for smaller divers but still provides 40 pounds of positive buoyancy. With a tough nylon outer fabric and inner bladder the jacket comes with dump valve and power inflator. Can be manually inflated. \$250. From Tabata dealers.

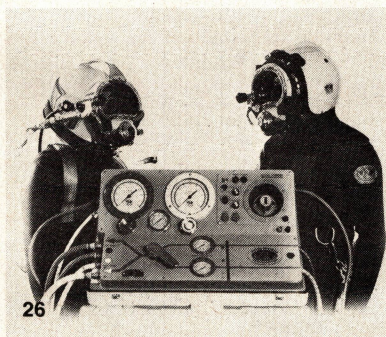
23 Tank Carrying Strap—The Tank Buddy allows the diver to carry his/her tank easily over rough terrain to the dive site. Nylon strap with steel clips can be folded up and stored in a BC pocket during dive. \$19.95. Optional shoulder strap \$8.45. From Scuba Innovations, 9300 Winkler Dr., Houston, TX 77017.



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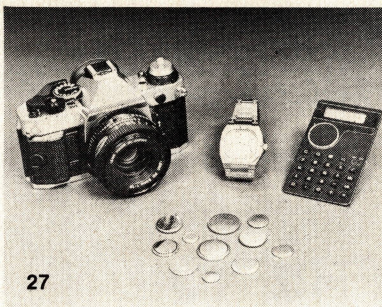


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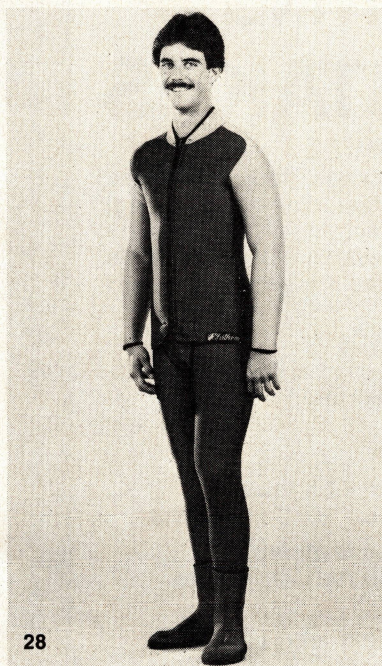
24 Wetsuits—Jean-Michel Cousteau Signature Suits from U.S. Divers feature 1/4 inch nylon two neoprene in either blue with silver accent or black with yellow accent. Seams are glued, blind stitched inside and lock stitched outside. Zippers are heavy duty Delrin. The five zipper model is \$275, the one zipper is \$250.

25 Scuba Tanks—Scubapro steel tanks are hot dip galvanized and have overcoats of black or blue epoxy for protection. 52.2 cubic foot tank with standard valve is \$320. 52.2 with Depth Compensating Adjustable Reserve is \$380. 71.2 with standard valve is \$350, with DCAR \$400. Self draining tank boot optional.

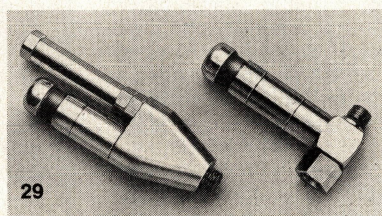
26 Surface Control Panel—The Dive Control System (DCS-1) is designed for the surface supplied dive equipment used in scientific and commercial diving. Can be used with high pressure cylinders and/or low pressure compressors. \$2,995. Diving Systems Int., 425 Garden Street, Santa Barbara, CA 93101.



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27 Button Batteries—With application to cameras, watches, calculators and other items, General Electric lithium batteries are manufactured in three and six volts, in nine sizes of button and cylindrical shape. High energy cells offer long shelf life and operate over a wide temperature range. From \$2.96 to \$7.50.

28 Lycra Suit—The Durasoft Mariner wetsuit features the new stretchy Durasoft foam neoprene, laminated with a shiny Lycra outside and soft plush inside. Suit has Lycra trimmed edges and a Velcro closed beavertail. Men's and women's pants and jacket (3/16 inch) \$280. From your nearby Fathom dealer.

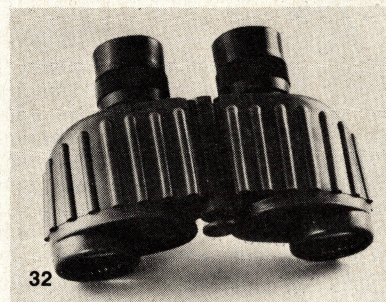
29 Tank Pressure Alarm—The Audio Alarm accessory from Scubapro sounds a high pitched squeal at about 500 psi tank pressure. One version attaches directly to the first stage high pressure port (\$90). The other attaches to the high pressure hose above submersible pressure gauge by a Y mount (\$100).



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30 Underwater Timer—Activated by pressure at a depth of five feet, the Scubapro Dive Timer automatically records bottom time. The one way ratcheted bezel rotates numerals to reset 0 at the beginning of each dive. The quartz timepiece is powered by a lithium battery providing up to ten years of service. \$80.

31 No-Help Drysuit—The self-donning option can be added to all DUI thin suits. The front zipper allows the wearer to zip himself into the suit, provides better fit through the telescoping torso, gives longer zipper life, and allows easy cooling off between dives. \$60. DUI, Inc., 1148 Delevan Dr., San Diego, CA 92102.

32 Binoculars—The Steiner 6 x 30 binoculars are rugged and waterproof. Lenses minimize glare, and wide field of view (429 feet at 1000 yards) gives comfortable viewing on rocking boat decks. \$199. For dealer information contact: Pioneer & Company, 216 Haddon Ave., Suite 522, Westmont, NJ 08108.

**The PADI Training Facilities &
Diving Ventures International Present**

"TURN A FRIEND ON TO DIVING" SWEEPSTAKES

GRAND PRIZE

A deluxe dive vacation package (four days/three nights, includes room, breakfast, dinner, and diving) in Florida at the Bahia Mar Yachting Center, Ft. Lauderdale (compliments of Professional Diving Schools of Florida, a PADI 5 Star Facility and DVI Resort Destination).

Second Prize

A \$250 Gift Certificate (to be used at the PADI Training Facility issuing the registration coupon). PADI will issue a check directly to the facility in the winner's name.

- | | |
|-----------------------------------|------------------------|
| 5 Third Prizes | 10 Fifth Prizes |
| 5 Heavy-duty "PADI Diver" Jackets | 10 PADI Sport Shirts |
| 10 Fourth Prizes | 10 Sixth Prizes |
| 10 PADI Windbreakers | 10 PADI Diver Hats |

HERE'S HOW TO ENTER

First, simply contact the nearest PADI Training Facility (write to PADI Headquarters for a list of participating stores). Take a non-diver friend into the facility and introduce him or her to the courteous staff. You will each receive a free gift — PADI's exciting "Turn On To Scuba" bumper decal — and a sweepstakes registration coupon. Just fill out the coupon and return it to the issuing facility, and you will become eligible for hundreds of prizes! Each time you take a new non-diver into the participating facility, you get another coupon, and another opportunity to win. Hurry — Sweepstakes ends June 15, 1983. Don't miss your chance — win big in PADI's "Turn A Friend On To Diving" Sweepstakes!

The official drawing will be held July 15, 1983. Only fully completed coupons will be honored. This promotion may not be available in some areas. Void where prohibited by law. No purchase required.

For a list of participating stores, contact:

PADI TRAINING FACILITY DEPT.
1243 East Warner Avenue • Santa Ana, CA 92705
(714) 540-PADI (7234)

PADI

Diver's Directory

Advertising rates: \$117.00 for three consecutive ads, \$198.00 for six consecutive ads, \$300.00 for a full year. DEADLINE: 28th of 3rd month prior to publication. PAYMENT MUST ACCOMPANY COPY. Send all material to: Diver's Directory, c/o Direct Response Advertising, P.O. Box 69910, Los Angeles, CA 90069.

ALABAMA

MCWHORTER ENGINEERING CO. 205/836-2814
P.O. Box 9014, Plant 1053, Gadsden Rd., Birmingham, AL 35213
Rebuilds, parts, accessories, ASME coded.
HP air compressors, units, systems, since 1952.

ARKANSAS

101 BOAT DOCK 501/467-5252
B.P.O. Box 164, Gamaliel, AR 72537
On Lake Norfork. Area dive information.
Marina boat & gear rental. 2 compressors, dive store.

CALIFORNIA

AQUATICS 805/488-5615
244 Market Street, Port Hueneme, CA 93041
Beginning & specialty classes, rentals, air, repairs.
Channel Island dive trips. A professional SSI Store.

AQUATICS OF SANTA BARBARA 805/967-4808
5370 Hollister Ave., Ste. 3, Santa Barbara, CA 93111
Channel Islands Charter, rentals, sales, repair, air.
Instruction: Basic, refresher to advanced courses.

ARGO DIVING SERVICES 213/510-2208
314 Metropole, P.O. Box 1201, Avalon, CA 90704
Guided underwater tours and instruction by
Jon Hardy on Catalina Island. Free information.

CATALINA DIVERS SUPPLY 213/510-0330
Avalon, Catalina Island, CA 90704 213/510-1954
Rentals, sales, air, 2 locations.
Pleasure Pier and Avalon Underwater Park.

FOUR SEASONS SCUBA, INC. 714/731-0359
13762 Newport Ave., Tustin, CA 92680
Sales, service, rental, instruction, repair.
We operate our own club boat for dive trips to California islands.

LAGUNA SEA SPORTS
6959 Van Nuys Bl., Van Nuys, CA 91405 213/787-7066
18503 Hawthorne Bl., Torrance, CA 90504 213/542-8609
Air, rental, instruction.

LAGUNA SEA SPORTS
925 N. Coast Hwy., Laguna Beach, CA 92677 714/494-6965
1951 Newport Bl., Costa Mesa, CA 92627 714/645-5820
6343 Magnolia Ave., Riverside, CA 92506 714/683-6244

NEW ENGLAND DIVERS 415/434-3614
398 5TH St., San Francisco, CA 94107
Sales, rentals, repairs and classes.
Mon-Thurs: 10-6, Fri: 10-8, Sat: 9-5

NEW ENGLAND DIVERS—LOS ANGELES 213/477-5021
11830 W. Pico Bl., West Los Angeles, CA 90064
Take Bundy off Santa Monica Freeway to Pico Bl. Open 7 days.
Mon-Sat. 10-8 Sun. 9-5:30.

PROFESSIONAL S.C.U.B.A. REPAIR 213/769-1484
5725 Cahuenga Bl., No. Hollywood, CA 91601
Professional repair is our only business.
Servicing all makes and models of equipment since 1961.

STEELE'S SCUBA
2350 El Camino Real, Santa Clara, CA 95051
Discount scuba, major brands, NAUI, PADI, YMCA lessons.
Send \$1 for 48 page mail order catalog.

TRI-VALLEY SCUBA SCHOOL, INC. 415/828-5040
21310 San Ramon Valley Bl., San Ramon, CA 94583
Scubapro Dealer & full line of major brands.
The East Bay's 'full service' pro dive store.

CONNECTICUT

CENTRAL SALES SCUBA	203/283-5007
136 Carter Rd., Thomaston, CT 06787 Ken Mischou, owner. Connecticut's most affordable dive shop. \$1 air fills. Classes, rentals, hydros, trips, repairs, used gear.	
INTERNATIONAL SCUBA CENTER, LTD.	203/621-TANK
758 Main St., Rt. 10, Plainville, CT 06479 CT's most complete dive center! Comprehensive year round scuba instr. PADI, YMCA, sales, service, rentals, \$1 air fills.	
JACK'S DIVE CENTER INC.	203/747-3170
Rt. 10, Plainville, CT 06062 Sales, service, instruction, photo specialists, rentals, trips, 5000 PSI air. Connecticut's largest dive store.	
ORBIT MARINE SPORTS CENTER, INC.	203/333-DIVE
3273 Fairfield Ave., Bridgeport, CT 06605 Sales, rentals, air, dive trips, hydro, U/W photo specialists. PADI & NAUI instruction, visual inspection. Open all year.	
SEA WOLF DIVER'S SUPPLY	203/873-8135
Town St., Rt. 82, East Haddam, CT 06423 Sales, certified instruction, rentals, repairs, air. A full service dive shop.	
THE DIVING BELL	203/775-3573
782 Federal Rd., Brookfield, CT 06804 Open all year. 5 Star PADI, instruction, equipment rental, hydros, photo, repairs, gifts. Travel with Joan and John Bell.	
WIN-SUM SPORTS—TRI-CITY DIVERS	203/872-6547
Rt. 30, Post Road Plaza, Vernon, CT 06066 Sales, rentals, repairs, air, hydro testing, trips, NAUI, PADI instruction. Connecticut's largest.	

FLORIDA

AMAROK SAILING & SNORKELING CHARTERS	305/538-4374
P.O. Box 611235, No. Miami, FL 33161 Sail & dive Keys or Bahamas aboard 35' sloop. Leave Miami or Nassau. \$790 wk/couple includes all + Capt.	
DIVE FT. LAUDERDALE ABOARD THE "SCUBA TOO"	305/989-5813
4565 S.W. 37 Ave., Ft. Lauderdale, FL 33312 See, pet and feed Oliver the Moray Eel featured on "Those Amazing Animals". Capt. Joe Schirck.	
DIVER'S DEN/PNEUMATIC SYSTEMS, INC.	904/871-4777
4720 E. Bus Hwy. 98, Panama City, FL 32404 Sales, rentals, service, fast charter boats, 6-15 passengers Instr. NAUI, PADI. Compressor sales, maint., overhaul.	
DIVER'S DEN SOUTH	305/595-DIVE
12614 N. Kendall Dr., Miami, FL 33186 PADI 5 Star instruction and specialty courses. Sales and service. Local and island dive trips. Photo. Air.	
DIVER'S PARADISE	305/553-2822
10740 S.W. 24 St., Miami, FL 33165 Most brands, sales, air, rental, service, dive trips, classes, export. Se habla Espanol.	
DIVERS UNLIMITED	305/981-0156
6023 Hollywood Bl., Hollywood, FL 33024 All brands, wholesale, retail, repair, rental, daily boat trips. Awarded #1 training facility by PADI.	
DIVERS UNLIMITED/MARATHON	305/743-7262 800/327-2740
Mile Marker 53, Holiday Inn, Marathon, FL 33050 Daily boat trips, training dives, classes, retail-all brands, leisure wear, rentals. Packages with Holiday Inn.	
DIXIE DIVERS, INC.	
1717 S. U.S. 1, Ft. Pierce, FL 33450	305/461-4488
1843 S.E. Federal Hwy., Stuart, FL 33494	305/283-5588
PADI 5 Star facilities, open 7 days, full service.	
FRANKS DIVE SHOP	305/848-7632
301 E. Blue Heron Blvd., Riviera Beach, FL 33404 Largest dive boat in the Palm Beaches. Dive with the best. Bahama trips available.	
GINNIE SPRINGS, INC.	904/454-2202
Rt. 1, P.O. Box 153, High Springs, FL 32643 Six 72" clear blue springs on the Santa Fe River. Camping, canoeing, 5000 PSI air, scuba, full service dive shop.	
LAUDERDALE DIVER	305/GO-SCUBA
1334 S.E. 17th St., Ft. Lauderdale, FL 33316 "On The Causeway" Complete master diver program. PADI distinguished service award. Instr., sales, svcs., air, photo, trips. Widest selection.	
MAC'S DIVING CHARTERS & SCHOOL	813/442-9931 813/461-7160
2126 Drew St., Clearwater, FL 33575 Daily reef & wreck dives. Store & club rates. One of the worlds largest divg. stores & school. Indoor heated pool.	
MANATEE HEADQUARTERS	904/795-2776
P.O. Box 124, Crystal River, FL 32629 3 day certification, Manatee tours. Full service dive shop, special Holiday Inn rates.	
NAUTILUS DIVE, SURF & SKI	
877 E. Palmetto Park Rd., Boca Raton, FL 33432	305/368-0555
2700 E. Atlantic Bl., Pompano Beach, FL 33062	305/943-DIVE
2104 W. Oakland Park Bl., Ft. Lauderdale, FL 33311	305/735-6227
NEW ENGLAND DIVERS	
2945 N.E. 2nd Ave., Miami, FL 33137	305/573-4600
9820 S. Dixie Hwy., Kendall, FL 33156	305/667-4622
Sales, rental, classes, instruction.	

NORINE ROUSE SCUBA CLUB OF THE PALM BEACHES	
4708 N. Dixie Hwy., West Palm Beach, FL 33407	305/844-2466
A membership club for certified divers. Dive trips 6 days a week.	
PLANTATION INN MARINA	904/795-5797
P.O. Box 1093, Crystal River, FL 32629. Instruction, rentals, boats, canoes, pkg. deals, pvt. Manatee obser. deck and air sta. at Divers Giant Spring. Golf, tennis, 150 rooms.	
PORT PARADISE RESORT	904/795-3111
P.O. Box 516, Crystal River, FL 32629. See the Manatee's 78 unit waterfront resort on Crystal River. Restr., lounge, marina, dive shop, rentals, cert. courses and checkout, air, glassbottom boat.	
PROFESSIONAL DIVING CHARTERS OF FLORIDA	305/761-3413
Bahai Mar Yachting Center, AIA, Ft. Lauderdale, FL 33316 Daily dive trips to over 50 sites, reefs and wrecks. Full and half day trips.	
SEAPRO SCUBA CENTER OF PALM BEACH	305/844-DIVE
3619 Broadway, Riviera Beach, FL 33404 Largest in Florida. Action sportwear. Sales, classes, rentals, 5000 PSI fill station.	
TREASURE COAST DIVERS	305/287-6777
413 S. Federal Hwy., Stuart, FL 33497 PADI training, including resort, review, O-W student referrals. Dive trips, 2 locations, including Bahamas.	
VORTEX SPRING & CAMP GROUND INC.	904/836-4979
Rt. 2, P.O. Box 18-A, Ponce DeLeon, FL 32455. Now ITC courses. Sales, service, rentals, 5000 PSI air, canoe rentals, group lodging dorms, RV hook-ups. Cavern and system dive. Gulf and Keys trips.	

FLORIDA KEYS

ATLANTIS MARINA & DIVE SHOP	305/664-4092
P.O. Box 708, Long Key, FL 33001 Complete dive shop and services, boat rentals, 3500 PSI. Camping nearby, best prices, some apartments available.	
BRENNER REALTY INC.-RENTAL HEADQUARTERS	305/743-5000
R.R. 1, P.O. Box 800, Duck Key, Marathon, FL 33050 Efficiencies, hotels, homes; week or month. Reef minutes away. Great rates, great location.	
BUDDY'S DIVE SHOP	305/664-4707
P.O. Box 409, Islamorada, FL 33036 MM. 79.5 @ Bud 'n Mary's Marina. Daily trips to Alligator Reef and Coral Gardens. Group instr., diving and room pkg. prices. Next door at Holiday Inn, Islamorada.	
CAPT. SLATE'S ATLANTIS DIVE CENTER	305/451-3020
51 Garden Cove Dr., Key Largo, FL 33037 MM.106.5 Dive Pennekamp aboard 40' custom dive boat. NAUI, YMCA, PADI, CMAS instr. Dock side air & mtls., grp & multi-dive discounts.	
CRAWFORD'S TROPIC ISLE DIVE SHOP	305/451-1063
P.O. Box 755, Key Largo, FL 33037 MM. 103 Reef trips, Pennekamp Park, PADI, SSI, NAUI instruction. Camera & scuba rentals	
DIVE PENNEKAMP ABOARD THE SOUTHBOND	305/451-1407
P.O. Box 637, Key Largo, FL 33037 MM. 106.5 31' boat fully equipped, fast, comfortable, 6 divers max per trip. Dive First Class, not tourist.	
DIVERS' WORLD OF KEY LARGO, INC.	305/852-5498
P.O. Box 1663, Key Largo, FL 33037 MM. 97.5 On the Atlantic at Rock Harbor Marina. Reef trips, air, instruction, sales, rentals.	
HALL'S DIVING CENTER & RESORT	305/743-5929
1688 Overseas Hwy., Marathon, FL 33050 Reef Trips Daily. Guaranteed start today instruction. Inst. college, huge merchandise selection, group rates.	
HOLIDAY ISLE DIVE & SWIM CENTER	305/664-4145
P.O. Box 482, Islamorada, FL 33036 20 Passenger Boat. Group rates.	
ISLAND SPORT-ABOUT	305/852-2586
98474 S. Overseas Hwy., Key Largo, FL 33037 MM. 98.5 FL Keys only camping outfitter. Save on motels. Rent a tent, stove, lantern, cooler, canoe & more. Prices & rsns. Free travel guide.	
ISLAND SPORT—DIVERS	305/852-2586
98474 S. Overseas Hwy., Key Largo, FL 33037 MM. 98.5 A PADI scuba training center. Checkouts, basic, advanced specialty courses. Devoted to teaching "New Horizons" of diving enjoyment.	
KEY LARGO	305/451-0730 eve's
8 Oceana Dr., Key Largo, FL 33037 2 BR. house nr. Pennekamp Park. Walk to water, dive shop & restaurant. Sleeps 4-6 from \$280/wk.	
KEY LARGO LUXURY CONDO	513/984-0866
Oleinik, 8555 Blue Cut Ln., Cincinnati, OH 45243 Luxuriously decorated, 2 bedroom, dock, pool, sauna, tennis. Minutes from best dive areas.	
LADY CYANA DIVERS	305/664-8717
P.O. Box 1157, Islamorada, FL 33036 MM 85.9 Daily reef trips aboard our 40' dive boat. Rentals, air, sales, service, instruction, group rates.	
LOOE KEY REEF RESORT & MARINA	305/872-2215
P.O. Box 509G, Ramrod Key, FL 33042 MM.27 Singles, doubles, eff., dorm, restaurant, dockage, instruction, & pool, group rates, charter boat, near dive shops.	

OCEAN DIVERS INC.	305/451-1113
Box 1113-A, Key Largo, FL 33037 Beautiful Pennekamp Park. Groups our speciality. Bahamas and Cay Sal Islands.	
PENNEKAMP DIVING HEADQUARTERS	305/451-1151
99696 Overseas Hwy., Key Largo, FL 33037 Daily reef trips, full rentals, air, sales, instr., repairs, group rates. Nicest dive boat in Keys. We beat any deal.	
PENNEKAMP STATE PARK CONCESSION	305/451-1621
P.O. Box 13-M, Key Largo, FL 33037 Free brochure. 25c for reef map.	FL: 800/432-2871
QUIESCENCE DIVING SERVICES, INC.	305/451-2440
P.O. Box N-13, Key Largo, FL 33037, MM. 103.5 Personalized charters in Pennekamp, only 6 divers per boat. Instruction: Basic. Divemaster.	
REEF ROVER II—CAPT. ED DAVIDSON	305/743-2400
4680 Overseas Hwy., Marathon, FL 33050 Multiple day, overnight trips: Lower Keys, Looe Key, Tortugas. 64' boat, wreck and wall dives.	
ROCK REEF RESORT	305/852-2401
P.O. Box 73, Key Largo, FL 33037 MM. 98 Divers Paradise, spacious grounds, beach, jacuzzi, comfortable accommodations and comfortable prices.	
SANDLEWOOD LODGE	305/743-4922
12501 Overseas Hwy., Marathon, FL 33050 TV, air conditioned, refrigerator, budget rates, free ramp & dockage.	
SCUBA KEY WEST—CAPT. BILLY DEANS	305/294-0660
Reef Raiders Dive Shop, U.S. #1 Stock Isle, Key West, FL 33040 Experience the Sambos, ten fathom ledge. USS Wilkes-Barre. "Every dive an adventure". Low group rates.	
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99650 Overseas Hwy., Key Largo, FL 33037 Dive and snorkel Pennekamp Park. Special weekday rates.	
SEA TRAIL MOTEL	305/852-8001
Rt. 5, P.O. Box 91, Key Largo, FL 33037 MM.98.5 Cable TV, air conditioned, refrigerator, budget rates, 10% discount. Advanced reservations May through Nov.	
STEVE KLEM UNDERWATER GUIDE SERVICE	305/451-1831
P.O. Box 1803, Key Largo, FL 33037 Guided Pennekamp fish feeding & photography tours. Scuba and photo instruction, photo rentals, film lab.	
THE DIVING SITE & CORAL LAGOON RESORT	305/289-1021
12399 Overseas Hwy., Marathon, FL 33050 Daily reef trips, 40', 34', 26' dive boats, charters, groups. PADI lessons, sales, repair, eff. apt., pool, tennis, packages.	
THE REEF SHOP DIVE CENTER	305/664-4385
Rt. 2, P.O. Box 7, Islamorada, FL 33036 MM 84.5 Sales, repairs, equipment rental, boat rentals, U/W camera rentals, dry storage, personalized attention.	
UNDERSEAS, INC.	305/872-2700
P.O. Box 319, U.S. 1, Big Pine Key, FL 33043 Equipment, air, rentals, repair, reef charters, shelling, guides, photography, spearfishing, tropical fish collecting.	

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BERRY ATLANTA	404/766-1186
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ALOHA DIVE SHOP—KOKO MARINA	808/395-8882
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AQUATICS KAUAI, LTD.	808/822-9212
733 Kuhio Hwy., Kapaa Kauai, HI 96746 PADI training facility, daily tours, sales, rentals. Photography and video taping of dive trips.	808/822-9422
CENTRAL PACIFIC DIVERS	808/661-8718
780 Front St., Lahaina, Maui, HI 96761 Daily diving trips, 5 islands, submarine dives. 5 day scuba classes. Undercurrent #1 recommendation.	
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GOLD COAST DIVERS P.O. Box 2064, Kailua, Kona, HI 96740 Two full service stores. We invite you to join us for the finest diving the Kona Coast has to offer.	808/329-1328 808/329-9266
HAWAIIAN DIVERS 2344 Kamehameha Hwy., Honolulu, HI 96819 Hawaii's largest full-service sport diving center Come to the shop where the locals go!	808/845-6644
HAWAIIAN WATERCOLORS P.O. Box 616, Kihei, Maui, HI 96753 Custom charters for the avid diver, photographer. Contact Ed Robinson for brochure	808/879-3584
JACK'S DIVING LOCKER P.O. Box 5306, Kailua, Kona, HI 96740 Skin and scuba instruction, join our dive charters, see the best part of Kona	808/329-7585
KAUAI DIVERS RR-1 Box 56, Koloa, Kauai, HI 96756 Personalized diving with Kauai's most experienced guides. Certification classes, daily tours, boat charters.	808/742-1580
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BERRY SCUBA 6674 N. Northwest Hwy., Chicago, IL 60631 12003 S. Cicero, Alsip, IL 60658 1717 Rand Rd., Palatine, IL 60067	312/763-1626 312/371-3366 312/358-3848
BLUE HOLE DIVE SHOP 4817 W. Farmington Rd., Peoria, IL 61604 Instruction, sales services, rentals, tours. Open M-W-F: 4-8, Saturdays: 9-5	309/676-1852
THE GEAR BAG, INC. 7767 W. North Ave., River Forest, IL 60305 NAUI-pro facility. Sales, rentals, travel instruction.	312/366-5777
THE OUTDOOR STORE 2224 W. Main St., Belleville, IL 62221 U.S. Divers, White Stag, Tekna, Ikelite, Farallon, air, rentals, accessories, Speedo swimwear.	618/277-5151
UNDERSEAS SCUBA CENTER 626 N. Addison Rd., Villa Park, IL 60181 Sales, service, rentals, instruction, cameras. Specializing in underwater photography.	312/833-8383
WATER SHED DIVE SHOP 1028 E. Walnut, Carbondale, IL 62901 Sales, rental, air, repair, recovery. NAUI instructions.	618/457-3397

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AQUA DIVING ACADEMY 1183 Congress St., Portland, ME 04101 Full service pro dive store. National Certified Instruction, private or group lessons.	207/772-4200
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AQUA-DIVE SCUBA CENTER, INC. 561 Main St., Rt. 18, Weymouth, MA 02190 PADI training facility, DVI member, open 7 days. Sales, repairs, rentals, photo courses, boat charters.	617/331-6700 617/331-6701
CAPE COD DIVING 134 Main St., Buzzards Bay, MA 02532 Full service dive shop, instruction all levels. Sales, service, rentals, air, trips.	617/759-8665
CAPT. FRED CALHOUN'S UNDERWATER SAFARIS P.O. Box 291, Back Bay Annex, Boston, MA 02117 Cape Ann dive charters, Bahama dive tours, lectures. USCG licensed, dive boat Easy Diver, Cape Ann Marina.	617/532-5431
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WOLF'S DIVERS SUPPLY 1207 Ann St., St. Joseph, MI 49085 Discount prices, USD, Dacor, Ikelite, Parkway, Tekna, PADI instruction, air, rentals, repairs, hydro.	616/983-1008

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NEW HAMPSHIRE

LAPORTE'S SKINDIVING SHOP Rt. 103, P.O. Box 53, Newbury, Lake Sanapee, NH 03255 Sales, service, rentals, air, salvage. 5 Star PADI store, certified instruction.	603/763-5353
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CEDAR GROVE DIVERS SUPPLY 492 Pompton Ave., Rd. 23, Cedar Grove, NJ 07009 National certified instruction, private or group lessons. Indoor heated pool, full service dive shop.	201/857-1748
DIVERS TWO, INC. 1 Main St., Avon, NJ 07717 Friendly, full service pro store. PADI instruction. Most major brands, resort trips. Stop in and check us out!	201/776-7755
DOSIL'S SPORTS CENTER—MANNY AND MARY'S Rt. 36, E. Kearsburg, NJ 07734 Discount prices, rentals, air, 3000 PSI, indoor pool, instructions, repairs.	201/787-0508
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SUB-OCEAN SERVICES 340 Broadway, Bayonne, NJ 07002 Air, rentals, instruction, sales, services. Serving the metropolitan area.	201-437-8683
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72's HAMPTON BAY DIVERS, INC.	516/727-2642
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DON COOK'S SCUBA EQUIPMENT	717/326-2091
940 Market St., Williamsport, PA 17701	
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HARRISBURG SCUBA CENTER, INC.	717/561-0517
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trips. PADI training facility. Weekdays 6 PM-9 PM, Sat. 9-5.	
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March 31-Dec. 31/7 days per week & holidays, 8:30-8	
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318 E. Butler Ave., Ambler, PA 19002	215/628-4935
3540 Street Rd., Bensalem, PA 19020	215/245-0141
PADI instruction, sales, rentals, repairs, trips.	
PROFESSIONAL DIVING SERVICES, INC	412/274-7719
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5 Star facility, Lake Superior charter boat.	

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5760 Cedarbridge Way, Richmond, B.C., Canada	604/273-0704
825 McBride Bl., New Westminster, B.C., Canada	604/524-1188
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Compare Caribbean's most economical dive packages.	
Includes air fare, room, all meals, tips, 3 dives daily.	
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SOUTH OCEAN BEACH HOTEL & VILLAS	809/327-4391
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P.O. Box 31, Spanish Wells, Bahamas	
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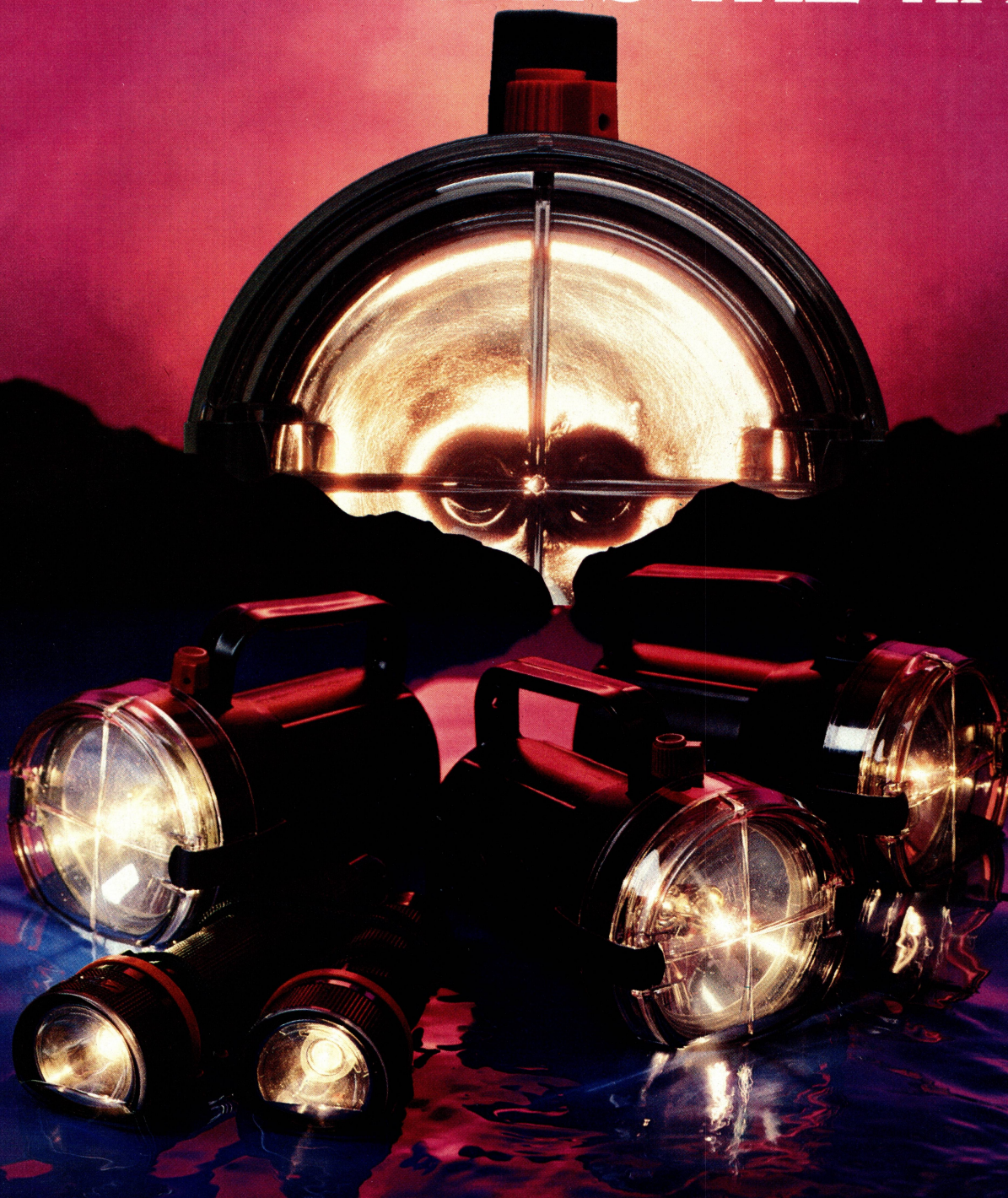
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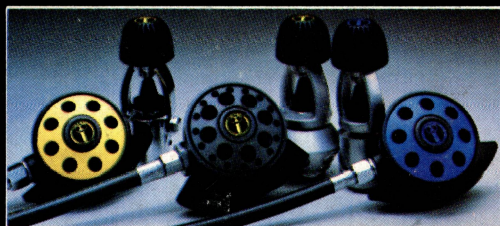
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